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Bee keeping for profit. A new system of b



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BEE KEEPING FOR PROFIT.



A NEW SYSTEM

OF

BEE MANAGEMENT.



SECOND EDITION.

BY

MRS. LIZZIE E. COTTON,

WEST GORHAM, MAINE.



ILLUSTRATED.



PRICE ONE DOLLAR.

1883.



MRS. LIZZIE E. COTTON.

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PREFACE.

In presenting this work I have no apology to make. After an experience with bees dating almost from childhood, and a careful study of all works published on the subject of bees, and the journals devoted to that particular branch of rural affairs, I find *theory, guess-work, prejudice and selfish motives* are so prevalent, as to confuse and discourage the *beginner*, and finally, all who are seeking after information by which they may make bee keeping a source of profit, and who wish to adopt a correct and scientific system of bee management.

In my early efforts at bee keeping, I met with many failures and heavy losses, from being confused by the contradictory teachings of selfish or ignorant bee keepers, and from a lack of that personal knowledge which experience, and a close study of the nature and habits of bees, has now placed in my possession. After many unsuccessful experiments, and careful investigation, and a close study of the natural habits and instincts of bees, I have succeeded in inventing a hive and new system of bee management which completely changes the whole process of bee keeping, and renders the business *safe, pleasant and profitable*.

The hive and system of bee management recommended in these pages, is entirely original with me, and is not patented. I invented the hive and plan of management for my own use, as I am engaged in raising honey for market, and wish every swarm of bees I keep to produce the greatest possible amount of surplus honey, and in the most convenient and attractive marketable form. I am induced to place this work before the public at the earnest and oft repeated requests of friends and correspondents. The work has been hurriedly written, as I had but little spare time to devote to this matter, consequently sentences are not all, perhaps, grammatically arranged. I have made the beautiful of secondary importance to the useful. I have endeavored, however, to make my statements so clear as to be readily understood and comprehended by every person of intelligence, although he may be wholly unacquainted with bee keeping.

Every person, who has a farm or garden, should keep bees, at least one or more swarms, to furnish honey for the use of the family. There is no greater luxury than nice honey in clean snow-white comb in nice glass boxes, such as is produced by my new system of bee management. This best of all sweets is now within reach of every one who has a plot of ground large enough to set a hive of bees upon.

After bees are once located in my hives but very little expense is required to keep them in proper condition, so that they will give a good quantity of nice box honey every year.

Under the old methods of bee keeping, bees required a great deal of care and attention, especially during the summer season. And then the winters were very destructive to them, many often losing their entire stock ; or if they were not a total loss, they were so damaged by the winter as to be of no profit, and two severe winters in succession were quite sure to finish them.

This was very discouraging, and many have abandoned bee keeping, entirely discouraged.

On my plan a complete revolution is effected in bee management, as will be shown in this work.

There is in my opinion no pursuit which offers greater inducements than bee keeping, especially to women. There are *very many* who are confined indoors nearly the whole time, excluded from the air and sunshine, to the great injury of their health ; and after this sacrifice they barely succeed in obtaining a livelihood. To such, bee keeping offers great inducements, such as improved health, and a handsome recompense for all labor performed. I am acquainted with many who have commenced bee keeping on my plan, who are meeting with complete success. A lady bought a swarm of Italian bees of me in 1874, and she writes me that from that *one* she increased her stock to over twenty swarms the *third* season ; besides she got over one hundred pounds of nice honey from the swarm I sent her the *first* season. Here I wish to be clearly understood ; I do not wish to hold out inducements which will never be realized, for the purpose of causing any one to commence bee keeping ; yet I believe bee

keeping on correct principles should be encouraged, until bees enough are kept to collect all the honey now allowed to go to waste, and which it collected by bees and stored in nice glass boxes, would add millions of dollars to the wealth of the country.

Since the day I introduced my Controllable Hive and New System of Bee Management to the notice of the public, the worthless bee hive swindlers and their tools have been boiling over with wrath against me, lying and slandering me through the public journals, and especially through the Bee Journals, and all because, that I, a *woman*, had succeeded in inventing a bee hive and new system of bee management superior to anything yet produced, and which was fast coming into use on its merits, among bee keepers; consequently the sale of other hives was *decreasing* in the same proportion. I first perfected the hive and system of management for my own use, with no thought of making it public; but through the kindness of my personal friends and others who have visited me to enquire into the new system, it has become known from Maine to Oregon, and adopted by many of the most intelligent bee keepers in the United States. And in compliance with that command in the good book which reads—"Let your light shine," I am determined to spread the truth, regardless of all opposition from the ignorant and selfish crowd which is constantly attacking me.

Without egotism, I claim a thorough knowledge of the habits and instincts of bees. Consequently I claim a thorough knowledge of the requisites of a

hive, and all fixtures pertaining to it, as well as a knowledge required to make bee keeping successful and profitable; and all this has been acquired in the school of *experience* and *practice*.

Kind reader, I respectfully submit the following pages, and ask for them a candid and unprejudiced consideration. Read *carefully* and *understandingly*, and apply to bee keeping, and I feel certain you will realize many times the cost of this book in the increased profits of your bees, managed as here directed.

The statements herein set forth are the result of many years *practical experience with bees* with a view of making the raising of honey for market profitable, and the general management of bees successful.

MRS. LIZZIE E. COTTON.

West Gorham, Me., Aug. 5, 1880.

Since the publication of the first edition of this work, in 1880, and the use of the Controllable Hive for more than twelve years, I find only a very few minor points in the hive which can be improved. I have made a complete revision of the hive and all fixtures, with the view of correcting every imperfection, however slight, and I feel certain that the hive as now arranged is perfect in every particular.

Thanking my patrons for past favors, and respectfully soliciting a continuance of the same, I present the second edition of this work, and invite to it the careful and unprejudiced consideration of every one who may read its pages.

MRS. LIZZIE E. COTTON.

West Gorham, Sept. 1, 1883.

CHAPTER I.

HONEY BEES.



QUEEN BEE.

A SWARM of bees contains *one* Queen, thousands of workers, and in the summer season, a limited number of drones. The queen is the only fully developed female in the swarm. She never leaves the hive except on two occasions—when leading a swarm, and when but a few days old, to meet the drone, or male bee, in the air, for the purpose of fecundation. It appears from close observation that only one impregnation is operative during life, as old queens have' been known to leave the hive for that purpose.

The natural life of the queen averages from four to six years. Queens sometimes become entirely barren before death; at other times the eggs of old queens are found to produce only drones. No matter whether deposited in drone cells, or worker cells, the progeny will be drones invariably. When drones are reared in worker cells, they will be very much dwarfed in size, notwithstanding the worker

bees attempt to overcome the difficulty, by lengthening the worker cells to accommodate the monstrosities.

The queen has a sting, yet she may be handled with impunity, for she will not use it except when in deadly combat with a rival queen. She receives the most marked attention from all members of her family; deprive a swarm of their queen, and they will, as soon as the loss is known, manifest the greatest agitation and alarm, and if the swarm is one just hived, and only a few hours from the parent stock, they will all return at once to the old home. They appear to fully realize the vast importance of a mother, and that with no means to supply her place they must soon perish; and to avoid their impending fate they return to the old hive. With old stocks deprived of their queen the result is different, as will be shown further on. Every one who keeps bees should strive to become familiar with the appearance of the queen, that they may be able to recognize her at a glance among thousands of workers, as it will often be necessary to look her up in my new system of bee management. In looking for the queen in full hives, she is usually found on the brood combs, unless in opening the hive she may have been frightened, and taken refuge in some hiding place, as the corner of the hive, at the bottom ends of the comb-frames, or some similar hiding place. After we become familiar with her appearance and movements we are able to find her quite readily, even when the hive is crowded with bees.



WORKER BEE.

The worker bee is much smaller than the queen. On the worker devolves all the labor of the swarm. They collect honey, pollen or bee bread, and propolis, or bee glue. The workers produce wax from honey, and from the wax they build comb, in which to store the honey and bee bread they collect, for their own use in time of need. Wax is produced from honey, as butter is produced from milk. Bees do not collect wax, but they collect honey, which by a natural process in the stomach of the bee is changed, and exudes from between the rings of the abdomen in minute scales of wax, which is detached by the bee and moulded into comb. The worker bee possesses a sting, and is ever ready to make use of it in defending home and treasure. This is a wise provision of nature, for were it otherwise, the other insect and animal tribes would appropriate the treasures of the bee—honey, wax, etc., and this industrious little insect would soon become extinct.

The worker bee possesses an instinct but little inferior to reason in the human family. A few examples will show their wonderful instinct: Twenty hives of bees, placed in a row, but a few inches distant one from the other, all of like size, shape and color; the bees to our perception *exactly*

alike, no difference in size, shape, color or action ; —yet every bee of this vast number (which at some seasons of the year would amount to more than six hundred thousand bees) in these twenty hives knows its own hive, and if let alone will not enter any other, except it be for the purpose of securing the honey therein for its own use, or in other words to plunder and rob its neighbor. There is no intercourse between swarms ; each is a separate colony governed by a queen. If through mistake the subjects of one enter the domain of another, a war of extermination is commenced at once. To test this point, I changed two hives so that they were reversed, the one occupying the place of the other. This was done while the bees were out collecting honey in a warm day. The first bees that entered the hive were instantly killed, and this was kept up until the hives were set in their proper places. The ground in front of the hives was covered with hundreds of dead bees. A bee is killed almost *instantly* by the sting of another.

The young bee on its first excursion from the hive does not leave its home without precaution. With a view to a safe return, it turns its head towards its home, rises slowly on the wing, at first describing a circle of only a few inches in diameter, as it recedes slowly backward, seeming to so mark every object surrounding the hive, as to enable it to return and enter, without the slightest danger of entering any other hive. Bees in Spring, in their first flight, mark their location in this manner. After the location has been thus marked, the bees leave

the hive in a direct line, and return by their way-marks with perfect accuracy and regularity.

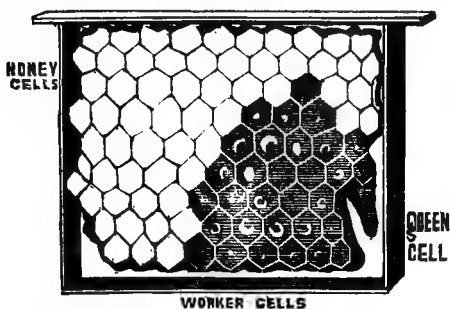


DRONE BEE.

The drone bee is a clumsy fellow. The drones are the male bees. Where a dozen or more hives are kept, there is no necessity for more drones than one swarm would naturally rear, yet each one of the twelve swarms carries out its natural proclivities, and rears a large number of these useless consumers, not one of a thousand of which is ever of any use. Swarms should not be permitted to rear a large number of these non-producers. A few are indispensable, yet we should take this matter into our own hands. Not one drone in five thousand ever fulfills the purpose for which it was created. Fifty drone cells are enough for one hive, and when more than this number are constructed (sometimes they will number a thousand or more in a hive) cut out all but a very few, and fit in a piece of worker comb in their place—it is more profit to raise workers than drones. Drones leave the hive to sport in the sunshine in large numbers, every fine afternoon in June and July. When on the wing, they make a very loud, coarse buzzing. They have no sting and may be handled without the least fear.

When the honey season is over, the worker bees drive out the drones, and a prosperous swarm will not tolerate a drone in the hive through the winter. In September I have seen a quart or more of drones clustered together near the entrance of the hive, whence they had been driven by the bees. The workers on guard about the entrance of the hive, would not let one pass into the hive, though they were constantly making the attempt. As soon as one would approach the entrance to the hive to pass in, a half-dozen or more workers would seize him, and drag him struggling to the edge of the platform and pitch him off, at apparent great danger to his portly and clumsy body.

I wish to impress strongly on the minds of all who adopt my plan of bee management, the great importance of cutting out drone cells, except a few in every hive. Don't leave *more* than fifty, half that number will do. After you have once cut out the surplus drone comb and fitted in worker comb, there is no further trouble with an excess of drones from that hive. It takes a great deal of honey to rear a large brood of drones, and still more to support them in idleness two or three months.



This engraving represents a section of comb in a miniature comb frame, containing all the different cells found in a hive. At the top are cells for storing honey. At the extreme right, near the bottom, is a queen cell complete, as it appears in queen raising, or in one week after a swarm has been deprived of its queen, in a full stock, or as it is found in stocks that swarm naturally, at the time the *first* swarm issues. Though often found in different places on the comb, and often to the number of a half dozen or more in one stock or hive, yet its relative position is *always the same*. It will always present the same appearance, whether at the edges or on other parts of the comb. Near the queen cell is seen the worker cells, containing brood in all stages of growth, from the tiny egg just deposited by the queen, to the full-grown grub, or young bee. Near the worker cells, at the bottom, are the empty drone cells.

BREEDING.

The natural increase of the honey bee is very imperfectly understood by the great majority of bee keepers. Very many suppose that young bees are raised only in the warm summer months, and their ideas of the *modus operandi* of increase are exceedingly vague. I find that strong stocks have maturing brood nearly every month in the year—I have found brood in stocks in December and January.

The queen lays all the fertile eggs in the swarm ; consequently all increase is dependent on her. I say the queen lays all the *fertile* eggs, because occasionally under certain circumstances we find eggs laid by workers, but under my observation such eggs never mature. Egg-laying workers are known to be such, by eggs being found in stocks that have been deprived of their queen, and the means of rearing another. This is one of the wonders of nature, of which no satisfactory solution has been given. The points established as to the sex of bees are these : The queen is a fully developed female ; the drones are fully developed males ; the worker,—*what is it ?* The worker is said by some to be *neuter*. If this last is true, how are the eggs produced ? Others say the worker is a female with generative organs *not fully developed!* A pretty nice point—to credit them with the power to produce eggs, without imparting vitality sufficient to germinate.

We will leave this knotty question, as it is of no consequence in the practical management of bees for profit. Suffice it then to say, the queen is the

mother of the entire family, and without a queen no swarm of bees can long exist.

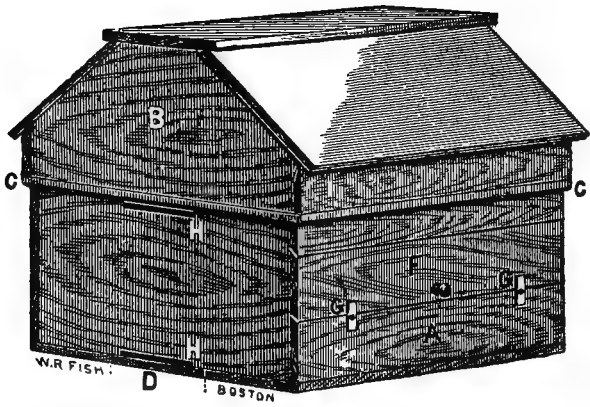
The time taken to perfect the three different kinds of bees—queen, worker and drone—varies slightly. The queen will mature in about sixteen days from the time the egg is deposited in the cell. The drone and worker each in about twenty days. This time is subject to some variation, governed by the weather, and number of bees in the hive, which causes the temperature of the hive to be greater or less. A high temperature will forward, while a low temperature will retard, the maturing of the brood.

Swarms with healthy prolific queens increase rapidly through the spring and summer. The queen at this season will deposit from one thousand to fifteen hundred eggs per day. Some writers estimate higher. To secure so large a number of eggs, and consequent increase of bees, we must have healthy prolific queens to start with, and offer every available facility to encourage the desired increase. How to do this successfully, is shown further on.

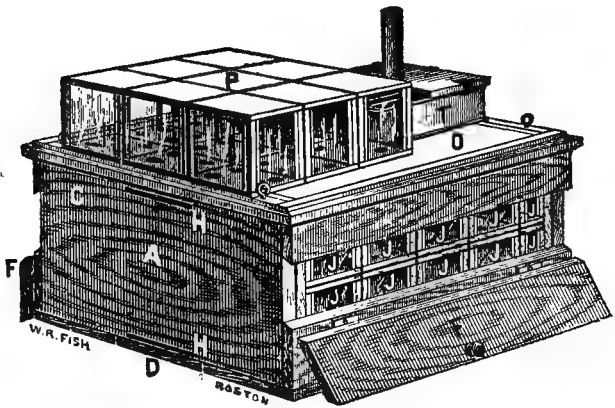
If we wish to secure a good harvest of honey, we must have the bees to collect it, and we must have them at the proper time, viz. : when the harvest is ready. To do this, we must encourage breeding to the utmost in early spring.

Early in the spring the queen enlarges the circle containing the brood; perhaps, if the stock was very strong, and everything favorable, she laid a few eggs in one or two combs near the centre of the

cluster of bees in January. Perhaps the cells occupied at that time were less than a dozen, all compact together in a circle, occupying less space than the size of a half dollar. As she progresses, this circle is enlarged, and the cells on the opposite side of this comb are used; then the next comb, and so on, at the same time enlarging the circle, keeping the brood compactly together, so that the bees, by clustering around it, can keep up the required warmth to forward the brood to maturity. As the young bees hatch, the queen proceeds with her duties of laying eggs until every brood cell is occupied, and as fast as a bee matures and leaves its cell, she is on hand with an egg to occupy the vacant place. This is kept up without cessation till swarming time, when the hive becomes crowded with bees, then, as preparation for swarming, the queen deposits eggs, from which the bees, by a special course of treatment, rear queens. When they are sealed over, as shown in the plate, the old queen leaves the hive with the *first* swarm to seek a new home. In about ten days the young queens hatch and lead out after-swarms—second, third, etc. When swarming is over, the strongest queen destroys the others, and reigns over the old swarm till another swarming season. This is the process in natural swarming; on my plan we improve upon the process, as will be shown in the proper place.



CONTROLLABLE HIVE.—FIGURE 1.



CONTROLLABLE HIVE.—FIG. 2.

Figure 1 gives a perspective view of the Controllable Hive as it appears ready for use. *Figure 2*, gives a perspective view of the Controllable Hive with the upper part of the case removed, and side door let down; showing the position of the Glass Honey Boxes J at sides and top, with Feeder T in rear at top, over Brood Section.

I have exercised great care, and incurred considerable expense, in giving drawings with measurements and directions for constructing Controllable Hives, glass boxes, etc., that such of my readers as wish may be able to construct the hives and manage bees according to the new system as taught in this work. I have no time or desire to establish a business in the manufacture of hives, but if any of my readers want a full sized Controllable Hive, ready for a swarm of bees, I will furnish them. The hive is not patented so any one can manufacture and use as many as they wish. They can make them at their home, especially in the winter season, much cheaper than I furnish them.

I will furnish one Controllable Hive with two sample glass honey boxes (the large and small sizes,) for Eight dollars; or the hive with a full set of glass honey boxes, for Twelve dollars.

CHAPTER II.

THE CONTROLLABLE HIVE AND NEW SYSTEM OF BEE MANAGEMENT.

IT is now nearly ten years since I perfected the Controllable Bee Hive, and New System of Bee Management. I commenced bee keeping with the common box hive, with no knowledge whatever of the habits of bees. I was not long in learning that I could not make bee keeping a success with the box hive, and I also found that the *thousand and one* patent hives were no better than, and the great majority of such hives *inferior* to, the simple box hive. I found there was no practical method of controlling the swarming propensities of bees. All such hives would swarm or not, as seemed to suit the caprice of the bees, which I found very perplexing. Stocks under the old plan of management, sometimes show every indication of swarming, such as clustering out, etc., yet they adhere pertinaciously to the old stock through the entire summer, a peck or more of them clustering idly on the outside of the hive, through the season; and if one put on boxes, it is all the same, they will do nothing. And such swarms often starve early

the next winter, after passing the summer in idleness. Other stocks with apparently not so many bees will swarm several times; often swarming so much as to reduce the number of bees so low that the bee moth will effect its destruction during the summer; there not being bees enough to protect the combs from the attacks of this destructive little insect. This swarming problem I found very difficult to solve. There were so many conflicting theories, I found I could gain no positive, reliable information from any source, to aid me, and that I must solve the problem by practical experiment.

Experience is a good teacher, but often a very costly one. Some told me if I wished to prevent swarming, I must cut out the queen cells, which the bees constructed preparatory to swarming. This was simply impossible with the box hive, so I constructed a hive with *movable* frames, so the bees could build their combs in the frames, and each comb of the hive could be lifted out separately. But when I attempted to prevent swarming by cutting out the queen cells, I found if I was to thwart nature in that way, I had, to say the least, a big job on my hands. I could cut out the queen cells, but within twenty-four hours after I had done this, the bees would have others constructed, and be ready to swarm, and as I kept cutting, they would keep building. They had the advantage of numbers and position, and when I opened the hive every day and destroyed such, to them, important work, they were not long in declaring and proclaiming me to be an enemy to them, and they

would attack me whenever occasion offered. I soon found that if not *impossible*, it was certainly *impracticable* to prevent bees swarming by cutting out the queen cells. It was a surprise to me that this plan should be recommended by bee keepers claiming to be well skilled in bee management. After proving this plan of no value, I was told if I would contract the entrances to my hives so the queen could not pass, I could thereby successfully prevent swarming, as the swarm would not leave without the queen. This looked to me like a very nice operation, to say the least, in fact, more nice than wise. However, I determined to test the plan. I accordingly contracted the entrances to my hives, and lo! the drones being larger than the queen, they could not pass! So, they clustered about the entrance, and in their efforts to get out, completely blocked up the passage, so the workers could not pass. Yet this plan of contracting the entrance was claimed to be protected by *letters patent of the U. S.* I found this plan for preventing swarming of no value whatever. Very many other plans were tendered me and tested with like results. I was all this time pushing my experiments, and learning something from experience every day. I was determined to arrange and construct a hive which would render bee keeping successful and profitable, and I can say at the present time, my labors have been rewarded with success.

I ought to go on and write out a description of all the old methods of bee keeping, and all the patent bee hive humbugs, with the thousand and

one *non*-patent hives and fixtures, gotten up expressly to swindle bee keepers out of their hard earnings, by a class of rascals, many of whom never owned a swarm of bees, and who care not one cent whether bee keeping is a success or otherwise, if they can pocket a round sum by their fraud. Were I to write out minutely these points, this work would become too voluminous and extended; besides it would be of no practical value to the bee keeper who wishes to keep bees for profit. I will not, therefore, give such minute descriptions of all the old systems, hives, etc., but will confine myself more closely to such practical information as will be of value to the bee keeper.

SWARMING CONTROLLED.

How to control swarming is truly an important question. I believe the successful controlling of swarming is the key to success and profit in bee keeping. Now how shall we do it? I will tell you. But first a few preliminary words. If swarms are desired, we arrange in early spring to have them issue in the swarming season, and at such a time as will best suit our convenience. When no swarms are wanted, we turn the whole force of bees to storing surplus honey in small glass boxes, throughout the entire season, and have no swarms, yet have the same increase of bees that would be gained if they swarmed. Then all the bees work at storing honey in boxes, instead of swarming out; and to any one who has not tested the matter, it is surprising to see the amount of honey which a swarm of

bees will store when not allowed to swarm, and fed judiciously; ample box room being provided, of easy access, so that all the bees have room to work; and by this plan, we are not constantly watching and waiting for swarms with uncertainty throughout the entire summer, for we know with certainty, when and where to look for swarms. In my plan, the swarming properties of bees are effectively controlled, without frequently disturbing or overhauling them, but by observing rules strictly in accordance with the habits and instincts of bees.*

If you wish your bees in Controllable Hives to swarm, keep the partition in place at the sides of the brood section, and the honey board over the top; or in other words, keep the bees confined in their labors to the central or brood section of the hive. Now, if you wish them to swarm in any particular week of the swarming season, ten days before, remove the old queen. [It is well to keep her, and to do so, take with her about a pint of bees, and

*Here let me be clearly understood. I admit that bees will sometimes swarm, with abundant room for work in their boxes. Yet I claim that on my plan, all increase by swarming may be prevented without great trouble or perplexity, such as has heretofore attended all attempts to bring about this greatly to be desired object. If a person commences bee keeping, with a certain number of swarms in Controllable Hives, and in early spring gives the bees access to the side boxes, and later, after they commence work in them, gives the bees access to the top boxes, giving them otherwise ordinary care, (except to feed if desired,) but a small proportion will swarm on the average, yearly. Much the larger portion will work in the boxes without swarming out, and give a handsome yield of surplus box honey, the yield of course being governed by the amount of feed given them, and the yield from flowers, etc. But if increase of stocks is preferred, rather than surplus honey—if the bees are not given access to the boxes, but confined in their labors to the brood section of the hive, being fed as directed, nearly every one will swarm, and swarm early.

put them in a small miniature hive, six or eight inches square, with movable frames, like those in the central part of the Controllabe Hive. Keep them shut in twenty-four hours; then give them their liberty, and they will work the same as a large swarm through the summer; but will not winter. If such queens are known to be *very old*, it is best to destroy them when we take them from the swarm. *Keep only young, vigorous queens!*] The bees in the hive from which you have taken the queen, will in nearly every instance, construct queen cells immediately to replace the loss of their queen. At the earliest possible moment, they seem to sense fully their loss, and to know that if they do not get another queen at once, their loss is irreparable. They usually will construct a number of cells, perhaps a half dozen or more. These will hatch in about ten days, and then swarms will issue.*

If you wish to devote but little time to your bees, and are not particular as to the time of swarming, and wish to have but very few swarms, or perhaps none at all, early in the spring, as soon as the bees commence their work, put on the boxes (sides and top,) and give the bees access to them; side boxes first, top boxes later. By this course, but a very small proportion of your stocks will swarm, (if this plan is to be practiced each year, it will be necessary to replace the old queens with young ones,

*Should any stock fail to swarm within two weeks from the time the queen is removed, at the end of that time, examine such stock, and if they have no queen, they must be furnished with one. About one stock in twenty, deprived of its queen as directed, will fail to rear queens.

every three or four years ; if this is not done, queens will die, or become barren from old age, and consequently loss of stocks follows ; keep this point in your mind ; *young, healthy, prolific queens are essential to success,*) as they will have ample room in the boxes for their labor. Occasionally a hive treated in this way will swarm, and if you wish to have no increase of stocks whatever, if a swarm comes out, hive it in a light box, and as soon as this is done, go to the hive which they came from and smoke lightly ; if the bees are cross, lift out the comb frames from the brood section with the bees adhering ; examine each and every comb *carefully* for queen cells, and cut off all but *one*. Success here depends on *care and thoroughness*, for if you leave more than one cell, your bees may swarm out again in a day or two.

After this is done, spread a sheet on the ground ; set a light box, like the one in which you have the bees, near one side ; raise the edge towards where you will shake the bees one inch or a little more, to give the bees a chance to enter the box. Shake the bees from the hive, by a quick, jerking motion, upon the sheet, the most of them some two or three feet from the box. With a large spoon or ladle, put a few up near the box, so they will enter, and disturb the others gently with a quill or light brush. When they commence to enter the box, they will set up a loud and continual humming, or call, and the bees on the sheet, if lightly disturbed with the quill or brush, will spread out, and march toward the hive, while those on the wing will alight, and

join them in the march. Now look *closely* for the queen, and capture her. If she is not found before the bees get into the box, shake them out again, and go through the same process, till you find her. As soon as you have secured the queen, the bees, in a few minutes, finding themselves destitute of a queen, and not having the means of raising another to take her place, will rise on the wing, and return to the old stock from which they came, and will not come out again, but will work in the boxes throughout the season. I will treat of this subject of swarming no further in this chapter. The merits of the Controllable Hive and New System of Bee Management, will be fully shown further on in this work, and the most explicit instructions given for rearing bees with profit.

CHAPTER III.

PATENT AND NON-PATENT HIVES, BEE JOURNALS, ETC.

I HAVE learned from bitter experience, as has nearly every one, who has kept bees for any length of time, the dishonesty, and utter disregard for truth, of a class of speculators who prey upon the unsuspecting bee-keeper. Patent hives—the great majority of them—are a curse and a hindrance to successful and profitable bee keeping. I have no time to describe the multitude of worthless patent hives, and the many tricks and swindles of the venders of the same, but I advise every bee keeper to consult his own interests, and have nothing to do with them. Ninety-nine out of every hundred are a swindle. I have tested their merits and know whereof I affirm.

I am sorry to find that many of the bee journals and bee-keepers' associations, are conducted on prejudiced and selfish motives, and in the interest of some individual, or company of men, for the sole purpose of making money from the sale of some particular hive or fixture, without regard to merit, or value to the practical bee-keeper. All honest

discussion, with a view to bring out facts and figures to guide the inexperienced bee-keeper in his labors, is suppressed. The bee journals should be the disseminators of useful knowledge among bee keepers. I am sorry to find the reverse true with many of them. After a thorough investigation, I feel it my duty to advise bee keepers, and those contemplating bee keeping, not to take all for granted that you read in the bee journals, for if you do, you will be very likely to soon find yourself robbed of your money, and your bees ruined.

Very many who write for the bee journals with high sounding words, claiming to be adepts in bee culture, have really no *practical* knowledge of the nature and habits of bees. We have supported a host of speculators in our business, for a long time; the object of this class has ever been, how best to secure our hard earnings, and with no desire or effort to aid in rendering bee keeping more profitable and desirable. The country is full of this class, and they always combine to crush out real merit in anything pertaining to bee culture, brought before the public by individual bee keepers, who are laboring to advance the cause by giving their experiences, gained from hard every-day labor among bees.

For many years I have written articles on bee culture, for the leading agricultural journals and newspapers. I have thus given much of my experience in detail, with no thought of further reward than the satisfaction of having contributed to aid bee keepers in raising bees with greater profit,

believing if all would so contribute of their practical experience with bees, great mutual benefit might be gained, and rapid progress made in successful and profitable bee culture. In consequence of my course in spreading information with a view to aid the cause, the class referred to in this chapter, and their tools, are boiling over with wrath towards me, lying, and slandering me through the public press, and by every other means which their depraved natures can invent; all because I have succeeded by hard study in perfecting a hive and a new system of bee management, which is fast coming into general use among bee keepers; consequently the sale of their worthless trash is decreasing rapidly: But I am anxious to get through with this part of my work, and reach the practical part, where I have the greatest confidence in my ability to give such information as will render bee keeping profitable and desirable.

CHAPTER IV,

FEEDING.

FEEDING bees, when judiciously managed, is the stepping stone to large profits from them. Bee keepers who have heretofore attempted to feed bees have met with poor success.

A bee keeper of my acquaintance paid fifty dollars for a patent apparatus for feeding bees together in the open air. The result was, soon after being fed they commenced fighting among themselves. The weaker stocks first fell prey to the stronger, then the stronger in turn were attacked, and the final result was, nearly every stock was ruined, and the plan abandoned in disgust after the first season's trial.

Now it is plain to every intelligent person, that in order to receive the greatest possible profit from bees, they must be fed. There can be no question as to the great benefit to be derived from feeding bees. The only question is, how, when and what to feed. It is as much a necessity to feed bees, as to feed our domestic animals, cows, sheep, etc., or to apply manure to plants, or any crop the farmer cultivates, to stimulate growth and increase the

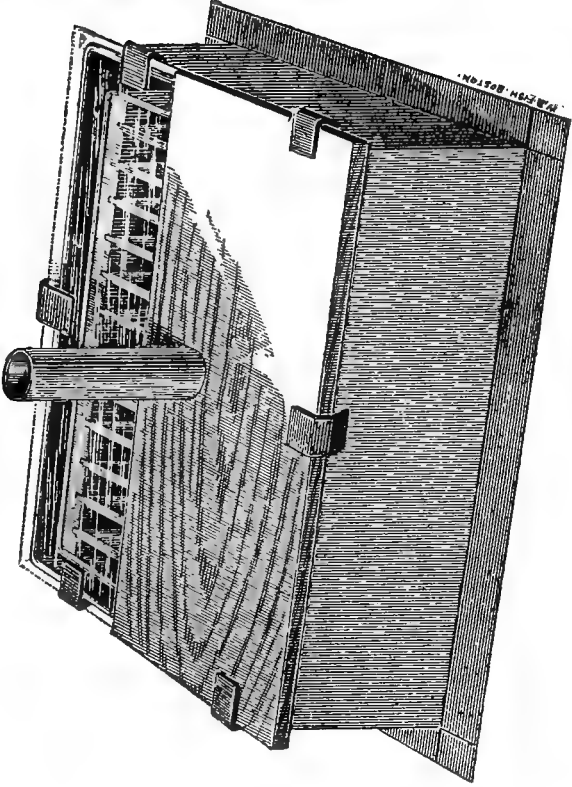
product and consequent profit of the same. We should look upon that farmer as either a fool or a lunatic, who should furnish his domestic animals no food, except what they obtained by grazing in the pastures and fields, the year round. And do you think his cows treated thus, would yield him a large product of butter, cheese and milk, and consequently a good profit in dollars and cents? Do you think he would find his cows, managed thus, so profitable as to induce him to keep cows to any great extent? Let a farmer manage thus—take his cows to the barn, milk them, then turn them out the year round to graze and provide for themselves, taking them up only to milk them, furnishing them with no food except what they procure by grazing—how long, think you, would such a farmer have cows to milk. Yet this is a parallel case with the bee keeper who furnishes his bees with no feed except what they can procure by their own industry. And is it surprising that bees treated thus pay no profit?

Again, the farmer who should year after year plant his corn, potatoes, etc., apply no manure, furnish no cultivation, yet expect to succeed in farming, harvest large crops, and get a good yearly profit in dollars and cents, and grumble because he did not, and at last abandon the business, asserting that there was no profit in farming, furnishes another parallel case to the bee keeper who lets his bees shift for themselves, and then grumbles because they pay no profit, and at last abandons the business, asserting that there is no money in bee keeping. /

It being self-evident that it is profitable to feed bees, it now remains to show how to do it with the greatest possible profit.

RECIPT FOR FEED.

To eight pounds of coffee crushed sugar, add two quarts of soft water, and whites of two eggs; bring to the boiling point over a *slow* fire, being very careful not to burn it. Skim off carefully all scum or sediment that rises, so that the feed, when cool, will be perfectly clear and about the consistency of new honey.



FEEDER.

To construct the feeder, get a tin-worker to make you a tin dish, with perpendicular sides, nine inches by eight inches square inside, two and one-half inches deep, *without a bottom*. Around the lower edge turn the tin out about one-half inch all round, for the dish to rest on when placed on the hive for feeding the bees. Around the top of this dish put a stout wire to keep it in shape. Get another tin dish made seven by eight inches square inside, two inches deep *with a bottom*. Place the smaller dish inside the larger one, the bottom of the inner dish even and level with the lower edge of the outer dish, which brings the top of the inner dish one-half inch lower than the upper edge of the outer dish; then when the outer dish is covered, (as it will be in feeding,) there will be a half-inch space between the cover over the outer dish, and the top of the inner dish. Place one of the longer sides of the inner dish against the inside of the outer dish, in such a position that there will be a half-inch space all round between the outer and inner dish, except at the side where you fasten them together; across this one side join them firmly together with solder; at the bottom near the opposite end solder brass or tin about one inch wide, across the half-inch space from the bottom of the inner dish to the edge of the outer dish, to hold the dishes firmly in place. Near the upper edge of the outer dish solder on some strips of lead about one inch long, by one-half inch wide, to turn down over the cover when put on, to hold it in place. Now get out two pieces of board seven and three-fourths inches long, two inches

wide, one-fourth inch thick. With a thick saw cut channels crosswise of the pieces, three-eighths of an inch apart and one-eighth inch deep, being careful to run your saw square across the piece every time. Next get out pieces to correspond with the number of channels, six and three-fourth inches long, two inches wide, one-eighth inch thick, (sawed out so the sides will be rough, to enable the bees the better to hold fast to them, when taking feed.) These pieces are to stand edgewise in the inner dish. With a sharp knife bring the ends of the pieces to a thin edge, so they will easily slip into the channels in the end pieces. Put the pieces with the channels, one across each end of the inner dish, the channels of each facing the inside of the dish, then slip the ends of your pieces that are one-eighth thick down through the channels to the bottom of the inner dish. Before you put them down into the dish, cut out a small notch, in what will be the lower edge of each piece after it is put down into the dish, so the food when poured in will flow to all parts of the feeder. The pieces or slats when all put edgewise in the dish will reach to the bottom and be on a level with the edges of the inner dish.

Now for the cover: Get out a piece of board a half-inch thick, nine and one-fourth inches long, and four inches wide. In the centre of this piece, with a sharp bit, make a one-inch hole; cover the hole with a fine wire cloth, bent a little convex. Put this piece of board over the outer dish, with wire cloth next to the inside of the dish, (put it across that end where the dishes are soldered together,)

hold it in place by turning up over it the pieces of lead soldered on near the upper edge of the outer dish. Cover the part of the dish not covered by the board, with glass, held in place in the same manner by the leads.

Your feeder is now finished. Set it over the brood section on the top at the rear, the wood cover next to the back of the hive, the glass toward the front. Cover that portion of the brood section of the hive not covered with the feeder, with a honey board, so no bees can get up into the cap of the hive.

Now to feed, pour the feed in at the inch hole, in the cover. The bees pass from the hive up between the sides of the outer and inner dishes, in the half-inch space, over the sides of the inner dish, in the half-inch space between the cover of the outer dish and the edges of the slats that are placed edgewise in the inner dish, and pass down *between the slats*, after feed in the inner dish. The hole in the cover should be kept closed with a cork, to confine the heat to the hive, exclude insects, etc. To feed without raising the cap of the hive, fit a tin tube in the top of the Feeder long enough to come up to the under side of top board of cap, through which make an inch hole to correspond with upper end of tube; pour the feed in by using a tunnel. Close the hole in cap with a cork, fitting closely, to keep out the wet.

When first commencing to feed stock, scatter some of the feed over the tops of the frames in the brood section; also on the sides of the dishes on

each side of the half-inch space leading to the feed, and on top of the slats of the feeder, so the bees may find the way to the feed. After they once learn the road, they will need no coaxing to induce them to take the feed given them. The first warm days in early spring, as soon as the bees can fly a few hours in the middle of the day, mix corn meal with rye meal, equal parts, and set out in pans or other shoal dishes, near the hives. The bees will carry this to their hives in considerable quantities. It is used as a substitute for pollen or bee bread, and is very essential in forwarding the increase of bees in early spring. The meal should be fed *very early* in spring, for as soon as the bees can collect pollen from the natural sources—trees, shrubs, flowers, etc., they will not take this meal. If rye meal cannot be obtained, use unbolted wheat flour.

FEEDING FOR EARLY SWARMS.

If you wish early swarms, keep the bees confined in their labors to the brood section of the hive, or in other words, do not give them access to the boxes, and commence as early in the spring as the bees begin to fly in the middle of the day, and feed each stock at evening about one-half pound of the liquid feed. Continue this till your swarms issue, then discontinue feeding.

FEEDING FOR SURPLUS HONEY.

If you wish surplus honey instead of swarms, put on your side boxes as early in the spring as the bees commence brisk work on flowers,—as a general

rule say a few days before fruit blossoms appear. Feed as directed for swarms until about ten days before white clover blossoms, then put on the top boxes, leaving room only for feeder. Then for ten or twelve days feed them all they will take. Feed at evening. They will at first, perhaps, take from five to ten pounds every night. Crowd them hard. for the object is now to get every part of the brood section (not occupied by eggs and brood) filled with honey; and if possible, crowd the bees into the boxes to commence the work of comb building, so that during the yield of honey from flowers, you can get every ounce collected, stored in the boxes.

By *early* and *judicious* feeding, we have encouraged breeding so that now our hives are filled, almost to overflowing, with bees, ready to gather the harvest from the flowers as soon as they begin to yield honey.

Discontinue feeding, while the yield of honey continues in full supply from the flowers. At the close of the yield, if you have boxes half filled or more, feed all they will take up for a few days, or until your boxes are finished.

FEEDING FOR WINTER.

The last of September or first of October feed such stocks as are short of stores, to winter them. Each stock should have twenty pounds of honey in the brood section to winter safely. If they have less than that, feed until they have that quantity, or take a frame of honey from a stock that has some to spare, and exchange with the one that is short, and

so proceed until all have sufficient stores to winter safely.

In no case take out frames at the close of the season, and leave that space without a frame, or with an *empty* frame. At the commencement of winter every hive must (to winter safely) have its full number of frames *filled* with comb, no matter if they are not filled with *honey* (if the hive has the required number of pounds,) but each frame must be filled, or nearly filled with comb, or there is great danger of loss from sudden changes of temperature through the winter.

In feeding for box honey, it often requires more than one pound of feed to secure a pound in boxes, for the bees consume some while storing it, and they often find some place in the hive which, like the crowded omnibus or street car, is not so full but that additions may be made.

The reader will bear in mind this simple fact: Bees do not *make* honey, they simply *collect* it. Honey undergoes no chemical change in the stomach of the bee.

Several years since, my bees had access to several molasses hogsheads, and the result was, I found pure molasses stored in my hives, in the same comb with nice white honey. I am satisfied that the bee does not *make* honey but *collects* it. My feed is prepared and recommended in view of this fact, and in perfect accord with all points bearing upon this subject.

The feed is of the same color as the nicest, white clover honey, and when put in boxes by the bees

with the honey collected from flowers (I have no doubt in many instances in alternate layers in the same cell with honey from flowers,) it cannot be distinguished, either in color or taste, from honey collected *wholly* from flowers.



CHAPTER V.

BOXES FOR SURPLUS HONEY.

IN the last chapter, directions were given when to put on boxes, but it is important to know more about this matter, the kind of boxes to use, how made, etc. I shall recommend a glass box; that is, glass sides with wood corner-posts, top and bottom, such as I use with the Controllable Hive; of two sizes, one holding about four pounds of honey, the other about two pounds. Thirty-one four-pound boxes, or sixty-six two-pound boxes, fit each Controllable Hive; or a part of each size may be used on the same hive at the same time. The larger boxes are just wide enough for two combs running the longest way of the box. The smaller boxes are just large enough for *one* comb running the longest way of the box. These boxes fit the sides and top of the Controllable Hive.* The bees enter the top boxes through the holes in the bottom of the box.

For the side boxes, omit the holes in bottom, and leave out the glass from one end, and in place of the glass put in a piece of wood two inches wide,

*For a complete description of these boxes, I refer to the drawings and illustrations of the Controllable Hive and all fixtures.

three-eighths inch thick ; place this piece in the center at the end, leaving an open space next to each corner post at that end for the passage of the bees from the hive to the boxes.

Before putting in the glass, if you have any pieces of white, clean comb, it will be a great advantage to stick two small pieces of this comb in each box, where you wish the comb built. Place the pieces in the top of the box two inches apart. Melt the edge of the comb and apply in place where you want it, while hot ; hold it in place till it cools, and it will remain.

The bees will commence work much sooner in boxes with the comb than they would without, even if the pieces of comb are not more than an inch square.

Honey in these boxes is very attractive, and is sought for in the market by customers who have purchased in this form. Honey put up in these nice glass boxes shows its superior quality at a glance, and customers prefer to purchase in such boxes, with no tare deducted for weight of box, to purchasing in the ordinary wood box with the weight of the box deducted.

In taking these boxes from the hive,* when filled

*When the box frames or partitions are taken out in the honey season, the bees will often, if the stock is strong, spread out over the bottom, so that in putting the frame in, a large number will get crushed. To prevent this, get out two pieces of wood, each about one and one-half inches wide, and one-fourth inch thick, one eighteen inches long, the other twenty-two inches long ; one edge of the long piece bevel to a thin edge, about the shape of a carpenter's chisel. Nail the long piece in the center to the end of the short piece at right angles with it, with the beveled edge down, so the beveled edge will be level with the end of the short

with honey, in warm weather, I recommend the following method: Take the boxes off early in the morning, and carry them to some outbuilding, and put them in a clean, tight box or barrel; place the boxes in such a manner that the openings in the boxes will be free for the passage of the bees from them. Spread over the box or barrel, a thin piece of cloth. The bees will leave the boxes, and collect on the under side of the cloth, which must be turned every few minutes, until all are out, except a few drones and very young bees; these can be taken out with a pencil. To facilitate the removal of the bees from the boxes, if any are obstinate about leaving, remove the glass in the sides of the boxes, *if the cover is not fastened to it*. The greater part of the bees from these boxes will return to their hives; excepting a *very few* young ones which had never before been away from the hive; these will be lost.

piece; also bevel the lower end of the short piece. When the bees are spread over the bottom of the box section, with this instrument push them gently back to the brood section. To do this, thrust the instrument down into the box section with the beveled edge down; taking hold of the end of the short piece or handle, work the bees gently back to the brood section, and when close up to the combs of the hive, let it remain to keep the bees from spreading over the bottom till you get the box frame down in its place, then remove it, and push the box frame up close to the brood section, so the ends of the boxes will be as near the brood combs, as the partition was when the combs were built. If this is not done, and a large space is left, the bees will either lengthen the cells in the outer comb of the brood section, or build a new comb, between the ends of the boxes and the outer comb of the brood section. In either case we would find it very troublesome when we remove the boxes, and wish to put in the partition for wintering. Be sure to put the large box frame up close to the combs of the brood section, that is, leave barely space enough for the bees to pass between the ends of the boxes and the outer comb of the brood section.

When boxes are to be taken off, use tobacco smoke freely, to quiet the anger of the bees. Puff smoke in at the entrance of the hive, before you touch it, then start the *top* boxes from their fastening, giving the bees a puff or two of smoke at every crevice about the boxes at the top and sides.

CARE OF HONEY IN BOXES IN WARM WEATHER.

Considerable care is necessary for the preservation of honey in boxes removed from the hives in warm weather. As soon as the bees are all out of the boxes, seal up all openings to the boxes, and set them away (in the same position they occupied in the hive, so the honey will not leak from the cells) in a *dry, dark, cool room*. We must now guard against the moth.

As in warm weather the instincts of the fly is directed to the dead carcass, so is the moth directed to honey-comb left without bees in the summer season, and by a similar process is each destroyed. When the bees have been off about ten days, or perhaps a little less if the weather is very warm, examine closely for the first appearance of the moth worms on the surface of the combs in the boxes. Their presence may be known by small thread-like webs or cocoons on the surface of the comb, growing larger as the moth worm enlarges in growth. If no remedy is applied, these worms will completely destroy the beauty of the honey in the boxes in a very few days. Watch the boxes closely, and on the *first* appearance of the least sign of worms in the boxes fumigate with burning sulphur, thus :

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Open the passages in the boxes ; have ready a tight, clean box ; saturate some *very dry* pine shavings with melted sulphur. After placing your boxes of honey in the box, set a saucer or plate in the box at the bottom, away from the honey boxes, so they will not take fire. Do not use too many shavings ; if you do, it will injure the honey comb in the boxes, by giving it a green color, and imparting to it a disagreeable taste ; a half-dozen shavings each four inches long is enough. Place them in the dish and ignite them, and cover closely, so no fumes can escape ; let them remain for a *few minutes*,—not more than five, less is often sufficient ; it depends something on the amount of sulphur adhering to the shavings, as well as the size of box, number of boxes to be fumigated, etc. With a little practice you will manage correctly and successfully. As soon as the boxes are fumigated, seal up *every opening carefully*, and set away as before directed, in a *dry, dark, cool room*. Watch the boxes for a few days, to be sure the worms are all killed. If you find they are not, give them another dose of the sulphur. After the worms are all killed, and every opening to the box sealed up, wrap each box separately in paper, and they will be safe through the summer.

How the eggs of the moth get into the boxes, has always puzzled bee keepers. It is hardly possible for the moth miller to pass through a hive crowded with bees, to deposit her eggs in the crowded boxes. How they get there must be guess work—that they are there is well known to many bee keepers. I feel very confident that the eggs are deposited there after the boxes are taken from the hive, and while we are getting the bees out of the boxes.

CHAPTER VI.

SWARMING AND HIVING.

UNDER the old systems of bee keeping swarming was very imperfectly understood. And even at the present time it is amusing to see how many old bee keepers manage their bees. There is a class of old fogies, who denounce all improvements and progress in bee keeping, and who, year after year, move in the same tracks in the management of their bees, asserting that they know all about bees that is worth knowing. It is, to say the least, amusing, to see how this class of bee keepers manage when their bees swarm.

In the middle of some very warm day in June or July, the alarm "*bees swarming*," is sounded. Immediately the whole household is turned out, some beating tin pans, some sounding horns, some shaking cow bells—anything and everything with which to make a terrible din is caught up in the excitement, and every member of the household works with the sole aim of making as much noise as possible. This is done to make the bees *cluster!* *If this is not done, they will leave for the woods!* I should think the poor bees would leave anyway, to get rid of the noise and foolish whims of their

owner. But no, they dislike to leave the place of their nativity, so in ten minutes or less from the time they leave the hive, they settle in a cluster on some object, generally within a half-dozen rods of the hive. And they would have done so in this case if no noise had been made. The noise did not affect them in the least.

Now the bees are to be hived, and we will see how it is done in the old way.

The bees in this case have clustered on a limb of a valuable pear tree. "Very sorry they have pitched there," says the man of perfect knowledge in bee keeping; "I dislike to injure that tree, but there is no help for it."

But first a hive must be prepared. It is not quite ready. (This is bad management.) It must be washed out thoroughly on the inside with salt and water, and rubbed over with some sweet scented herbs. A bottom board must be got ready; etc., etc. At last the hive is ready. Now this wise bee keeper places a table near where the swarm clustered, sets his hive on the table, raises one edge four or six inches, takes his saw—Oh, it is a pity to cut that nice limb full of fruit from the pear tree, but it must be done, thinks this man of perfection in bee management.

He grasps the limb firmly near the cluster of bees. They are very *cross* and *uneasy*. They have been clustered an hour or more, while he has been getting his hive ready. He saws off the limb on which the bees are hanging, and places it carefully, with the bees adhering, on the table, by the side of the

hive, covers all very nicely with a clean sheet, and leaves them alone to enter the hive. At about sunset he will place the hive with the bees in it on the stand it is to occupy.

At the time designated (about sunset) he goes out to his hive on the table. It has been a very hot afternoon, and the hive was where it received the full force of the sun's rays. He carefully raises the sheet. There is the limb on which the bees clustered—but where are the bees? they are not on the limb! Why, in the hive, of course. That is where he expected to find them. He peeps carefully under the hive to see how they are getting along, but astonishment is depicted on his countenance when he discovers that his hive is empty. His bees have left for other parts beyond his knowledge. He tries to think of some reason why the bees have gone, and seeks to lay the blame upon the hive. "Oh!" he says, "I guess they did not like the hive, but I guess I shall have better luck next time."

To a progressive bee keeper, one who has correct and practical knowledge of the natural habits of bees, it is very plain why they left. They were actually driven away by mismanagement. The heat of the sun pouring down upon them, was enough of itself to drive them off. Then placing the limb, with the cluster adhering to it, on the table near the hive, showed lack of knowledge of the natural habits of bees. The hive might as well have been in the house, as placed where it was. Then an hour or more taken to get the hive ready,

gave the bees time to send out their scouts, to look up a location of their own, and when these scouts returned, they left with them for a new home. I contend every swarm does this, viz. : They swarm out of the old parent stock, led by the old queen. They cluster on some object, as a tree, bush or vine, near the old home. Then they immediately send out a few bees or scouts to look up a new home. These scouts may be gone a longer or shorter time. When they return, if they find the bees clustered where they were when they left, they soon lead them off to the new quarters, but if before the scouts are sent out, or before they return, the swarm is hived and placed on the stand it is to occupy, then the swarm will not leave, for the scouts know not where to find them, or if they should find them, the bees would seldom leave a good clean hive, for a home in the woods. These scouts may often be seen playing about the place where a swarm has clustered, for several days after the swarm has been hived.

Had this bee keeper placed his hive on the table, as soon as the bees were clustered, and raised the front edge one inch, instead of four or six inches, and then, instead of cutting off the limb, if he had taken a basket or pan, placed it beneath the cluster of bees, and by a sudden jar of the limb dislodged them from it into the basket or pan, then emptied them down in front of the hive, and sprinkled lightly with a little water, at the same time disturbing them gently with a quill or light brush so they would not collect around and block up the entrance,

except a very few that may be flying in the air (and these will return to the old hive,) in this way getting them all into the hive, and immediately carrying it to the stand it was to occupy, covering it with a board to shade it from the hot rays of the sun, or placing it in the shade of a tree—he would have saved his bees, the damage to his pear tree, and much perplexity.

By the old methods of managing bees, there was no means of knowing when to expect swarms; consequently the bees were sometimes watched all summer, in expectation of swarms any pleasant day, as outside indications were favorable for them; yet they would often adhere to the old hive throughout the entire summer.

With the Controllable Hive and New System of Bee Management, as shown in this work, swarming is brought completely under the control of the bee keeper. It is well for him to understand correctly what are the requisites and preparations for natural swarming by the bees, when left to themselves in a natural state. They are as follows: The bees must be obtaining honey freely, either from flowers, or from feed supplied them. The combs must be filled with brood in all stages of growth, from the egg just deposited in the cell, to the perfect bee just emerging. (And from this, bee keepers will note what conditions are required at the time swarms are forced, as recommended in my plan.) When this condition of affairs is reached, the bees construct queen cells, (that is if they decide to swarm; they will do as they like

about it, if left entirely to themselves,) from which is about sixteen days the queen will hatch, unless the bees should change their intentions, and decide not to swarm, and destroy all the queen cells. Remember, they are having it all their own way. When these cells are sealed over and finished is the time (if everything is favorable) when the first swarm leaves, led off by the *old* queen. Some of the most reliable works on bees have taught that the queen cells *must be half finished before the queen will deposit the egg that is to produce the queen*; but this I find by close observation, is a mistake; for if you take the queen away from a stock, with no queen cells in any stage of formation in the hive, the bees will rear a queen from a worker egg, deposited in an ordinary worker cell. And who shall say they do not do this when the queen is present? I am satisfied they do.

Thus we see in natural swarming, with the bees left to themselves, the old queen leaves with the first swarm at about the time the queen cells are sealed over and finished, which is about eight days before the young queens hatch.

When the young queens hatch, after-swarms (as second and third issues, or all after the first,) will issue. Second swarms may be expected in about eight days after the first. This time will somewhat vary, as the hatching of the queen sometimes depends on the weather, the number of bees left in the old stock, etc.; a low temperature retards the hatching, while a high temperature forwards it.

At evening of about the eighth or tenth day after

the first swarm, by putting your ear close to the hive you will hear, very plainly every few minutes, several clear and distinct "peeping" sounds, very sharp at times, then hoarse and dull. This sound proceeds from the young queens just hatched. When it is heard, look out for a swarm the next day, though it sometimes happens that one or two days will intervene before they will issue. But as long as the sounds continues, be on the lookout for swarms. This "peeping" can always be heard before a second swarm issues, if we take the trouble to listen. The time between second and third swarms is invariably from one to four days. It is useless to look for after-swarms from a stock *after twenty* days from the first. They are generally all out within sixteen days from the issue of the first swarm. I have given in another place, under the head of "Swarming Controlled," instructions how to manage swarming under my new system. Some additional information I will give in this connection.

Just before swarms are expected, if there are no trees near your hives or if there are large trees from which it would be difficult to take a swarm of bees were they to cluster on the branches, procure several evergreen trees, such as spruce or fir, three or four feet high. Leave the limbs on, excepting about a foot at the bottom. Sharpen the trunks, so they can be set in the ground and lifted out with ease. With a bar make large holes, about a foot deep, in front of your hives, some distant about six feet, others from twelve to thirty feet. Set a half-dozen

or more of these trees in these holes, putting in by the side of them a small stone or piece of wood, to hold firmly in place, and prevent swaying by the wind. When your swarms issue, they will be very likely to cluster on some of these trees, when they can be conveniently gathered in the Controllable Hive.

In hiving, if the bees have clustered on some one of the trees set for them, place the Controllable Hive on the stand it is to occupy, allowing the stand to project two feet in front of the hive. Draw back the bottom board under the brood section ten or fifteen inches, to give the bees a good chance to enter the hive. Shade the hive well. Now go to the tree on which your swarm is clustered. Remove the stone or piece of wood that holds it in place; lift the tree, carefully avoiding any jar, carry it to the hive, and hold the cluster down to the stand and close up to the hive, as near the entrance as possible. Then give the tree a sudden jar, sufficient to dislodge the cluster of bees. They will fall directly at the entrance of the hive, and immediately commence to enter. Sprinkle lightly with water, and gently disturb those that stop about the entrance, with a quill or brush, till all are made to enter the hive. Then slide the bottom board forward to its place, and the work is done.

Should the bees cluster on some large tree or other out of the way place, the manner of hiving must be varied. Set your hive near by with a wide board in front to keep the bees out of the grass and dirt. Arrange the hive as before directed. If the

bees are clustered on a small limb, high above your reach, secure a basket to a pole, and raise it directly beneath the cluster. Dislodge the bees from their position, when they will fall directly into the basket, which you should take down quickly and shake the bees from it down to the entrance to the hive, and proceed as before. Keep the limb on which they were clustered in motion for a few minutes, to prevent their return. Should they cluster on the body of a tree, or a large limb, where they cannot be shaken off, set your hive near by, as before directed, and with a handled dipper dip them off and turn them down in front of the hive near the entrance. Dip very carefully, so as not to crush any of the bees. They will not attempt to sting if you treat them well, and prove to them that you are their friend. After you have dipped off a portion of the bees, and got them moving into the hive, if the queen is with them, they will all leave the cluster and join their companions who are entering their new home. But if the queen remains with the cluster, as soon as those entering the hive discover that she is not with them, they will leave the hive and rejoin the cluster. So it is well to keep dipping as long as you can get any of the bees, or till you are certain the bees are leaving the cluster and entering the hive of their own accord.

It sometimes happens in natural swarming, that when a swarm issues, led by the old queen, which has occupied the hive for a year or more, that she finds herself unable to fly, and drops down in front of the hive. In this case if left to themselves, the

bees after flying about for perhaps five or ten minutes, will return to the hive whence they came, and remain until the young queens hatch, issuing again, about the time a second swarm would have come out, or perhaps a little earlier.

If you are on hand you can prevent the swarm returning, but you must be lively. If you find the bees are flying longer than usual without clustering, and appear scattered and disorganized in their movements, look in front of the hive from which they issue, for the queen. You will probably find her within two or three feet of the hive. Put her in a tumbler, and cover closely to prevent her escape. As soon as you find the bees have commenced to return to the old hive, set it back out of the way, and throw a sheet or some other covering over it.* Then set your Controllable Hive in its place, with the bottom board drawn back as directed in hiving a new swarm. Set the tumbler containing the queen over the brood section, so the confined queen can pass down into the hive, but leaving no chance for her to escape by any other way. The bees will then enter the hive readily. And as soon as all are in, which will be in a few minutes, remove the hive to a new stand and shade as directed before. Set the old stock back in its place.

The foregoing circumstance often happens when

*If other hives are near, on each side, it will be well to throw the covering over them also, to prevent the swarm entering any other than the designed hive, as they might possibly do, if the hives were only a few feet distant.

bees are managed on the old swarming plan, and queens that are unable to fly are usually very old. On my plan of management, such cases are of rare occurrence.

Natural swarms usually issue between nine o'clock in the forenoon and one o'clock in the afternoon. Occasionally one will issue earlier in the forenoon or later in the afternoon; but as a general rule they make their appearance between the hours specified.

Very early swarms hived in Controllable Hives should have access to the boxes on one side only. In about ten days after being hived, and as soon as the bees are well at work in these, give them access to the other side. Swarms that are hived late in the season will not require boxes, until the next season, as it is necessary to have the brood section filled, or nearly filled, before the bees have access to the boxes.

It is important that we have the combs in the brood section built straight in the frames, so as to be easily lifted out separately. To aid in securing this object, when a swarm is first hived in a Controllable Hive, raise the rear of the hive four inches, by putting under it a piece of joist, having the hive perfectly level from side to side. This gives the frames a pitch forward, and will greatly aid in securing straight combs. Let the hive remain in this position for a week or ten days, then set it down level. If you have it to spare, one frame filled with comb, placed in the brood section near the center, will insure straight combs in the balance. If no precaution is taken in this direction, the bees will

sometimes build the comb crosswise of the brood section, notwithstanding the triangular comb guides in the frames of each Controllable Hive. As straight combs in the brood section are very important, we should employ every available means to aid in securing them.

It is well to keep on hand a few plain boxes, each with four movable frames, like those in the Controllable Hive. If at any time a swarm comes out at the very last of the honey season, hive them in one of these boxes. They will probably enlarge or quite fill the four frames with comb, and perhaps store a little honey. Then, in the fall, put these four frames with the bees and comb, in a Controllable Hive, and add two frames, well filled with honey, from a stock that can spare it. In this way you will build up a good stock for winter, whereas if you had hived them in a full sized Controllable Hive so late in the season, they would probably have put a little comb in each of the six frames, but not enough to winter, rendering it necessary for you to feed with the liquid feed in the fall. It is better to have four frames nearly or quite filled with comb, than to have six frames with a very little comb in each. It sometimes happens that a swarm of bees, which has worked well in boxes through the entire honey season, will swarm about the time the yield of honey ceases. If managed on the old plan, such swarms are worthless, but by hiving them in a box with four movable frames, as directed, they make valuable stocks. All such swarms may be returned to the old stock, as directed in another chapter, yet

we sometimes wish to increase the number of our stocks to the utmost, and it is convenient to know how to make valuable stock of these late issues. Then they can either be returned or hived, whichever the bee keeper thinks is most for his or her interest.



CHAPTER VII.

ANGER OF BEES.

THE anger of bees, when once thoroughly aroused, is much to be dreaded, as the results which follow are often of a very serious nature. In my own case I can handle bees with perfect impunity. They rarely make any attempt to sting, no matter what liberties I take with them. I always intend to be very careful, and handle them gently, making them understand that I do not mean to harm them. In my first efforts in handling bees they were very apt to sting me, for the reason that I did not understand their nature; consequently they mistook my intentions, and often forced me to seek shelter from their attacks. Now I seldom use any protection when working among them. Often, in transferring the bees and comb from the old box hive to the Controllable Hive, I roll up my sleeves, and with no protection whatever for the hands or face, cut out the comb from the old hive, with the bees adhering to it, and arrange and fasten it in the new hive, without the bees making any attempt to sting me.

I would not recommend anyone to do this, until they are so well acquainted with, and accustomed to handling, the bees, as to understand perfectly

their very characteristic, and be quite certain that they will not make an attack. It is better to protect the face and hands from their attacks as you will thus feel greater confidence in yourself, and can perform all operations without fear of stings. It is well to understand what will arouse the anger of bees and cause them to sting. If we breathe upon them, when they are in and about the hive or boxes, they deem it an insult, and will dash at and sting us at once. Any sudden jar of the hive is instantly resented. All quick, spiteful motions about the hive, such as running, jumping, etc., are noticed, and quite sure to be followed by a sting. The finger pointed at them with a quick, spiteful motion when they are standing as sentinels about the entrance of the hive, often provokes stings. If they come buzzing around, threatening to sting, perhaps striking your hat almost like a bullet, and should you return the compliment by striking at them with your hand, they will be quite sure to sting you. The better way is, if unprotected, to hold down your head so as to protect your face, and move away from the hive as quietly as possible. When the bees find you are retreating, they will not follow you far. Always remember that if one bee stings you, others are very sure to immediately follow, unless you retreat. I believe that bees have a language by which they make known to each other their wants and wishes; and I feel certain they know those who have the care of them, and become accustomed to the motions and appearance of those who are seen by them daily.

The members of my family are seldom stung by the bees, notwithstanding I sometimes have fifty hives or more where we pass within twenty feet of them many times a day, while the bees are flying in thousands about each hive. In the middle of the day, in the honey season, the air for many rods about the hives is full of bees. I find my bees are much more likely to attack strangers who come to see them, than members of the family.

TO SUBDUCE THE ANGER OF BEES.

I have tested every means recommended for subduing the anger of bees, and have found tobacco smoke the thing when rightly applied.

Have a tin-worker make you a tin tube, one inch in diameter, six inches long, and fit stoppers of soft wood closely in each end, two and three inches long respectively, with a hole through each, one-fourth inch in diameter. Fit one end of the longer stopper to hold in the mouth. Before placing the shorter piece in the tube, cover the inside end with wire cloth, bent a little convex, to prevent the ashes and tobacco filling the quarter-inch orifice. Taper the outer end of the short piece nearly to the point. Remove the mouth-piece, and fill the tube nearly full of tobacco (cigars are best for they burn freely.) Dip with live embers, replace the mouth-piece and blow the smoke from the pointed end.

With this instrument smoke may be forced among the bees in any part of the hive or boxes. In all operations likely to arouse the anger of the bees, as taking off and putting on boxes, lifting out comb

frames, putting on and taking off feeder, removing the honey board, examining the rearing boxes in queen raising, etc., smoke the hive well. In short, use smoke freely when about to perform any operation upon the bees. Before touching the hive give the bees two or three smart puffs at each entrance of the hive; then commence your operations immediately. If the honey board is over the brood section, and your operations are to be performed in that part of the hive, raise the board just enough to puff in the smoke, but not enough for the bees to come out. Give them the smoke here freely for about one minute, before you remove the board. They will show their submission by a loud humming throughout the hive. When they set up this humming noise is the time to proceed with your work. Remove the honey board entirely, keeping the smoker at hand ready for use, and giving them a puff of smoke occasionally to keep them under submission.

It is best for the inexperienced bee raiser to protect the hands and face in all operations, at least until he feels perfect confidence in his ability to avoid irritating the bees sufficiently to cause them to sting. To protect the hands, wear thick woolen mittens, with very long wrists, so they will come up over the dress or coat sleeve, thus protecting the hands and wrists completely from stings. To protect the face and neck, get coarse black lace, one-half yard wide and a yard and a quarter in length. Take three-fourths of this piece for the front breadth, and the balance for the back breadth. Seam to-

gether at the selvedges, and gather the upper edge on an elastic cord so as to fit closely, and draw around the crown of the hat. When putting on the hat ready for use, leave the longer part in front, to button beneath the coat or vest of a gentleman or the sack of a lady. At the back the lace tuçks beneath the collar. Thus protected, we are perfectly safe from stings, and can see as well, and perform all operations nearly as well, as when uncovered.

The best antidote for stings is the application of water in which salt has been dissolved—a heaping teaspoonful of salt to a teacupful of water. Bathe the affected part freely, and in severe cases take a swallow of the salt and water into the stomach. Avoid rubbing or irritating the stung part. Be sure to extract the sting immediately, as the longer it remains, the more serious will be the consequences.

CHAPTER VIII.

THE BEE MOTH.

IN some localities the bee moth is said to be very destructive, yet I regard the depredations of this insect as much less to be feared than some bee-keepers suppose. The bee moth is the agency provided by nature for returning back to the earth the contents of any hive when left by the bees, in the same manner that the flesh fly is the means provided for returning to the earth the carcass of any animal.

I do not believe that a strong, healthy stock of bees was ever attacked and destroyed by the bee moth. The stock must from some cause become reduced in numbers, so there are not bees enough to cover all the comb, before the moth will make an attack. But when the comb is unprotected, the moth follows the instinct of its nature, and deposits her eggs in it. The bees from some cause keep decreasing, and the moth continues depositing her eggs in the vacated comb, until the entire comb of the hive is a complete mass of vile worms, the progeny of the bee moth.

About this time the bee keeper notices for the first time (for, if he is keeping bees on the old plan, he lets them take their own course, believing if he

meddles with them, they will "run out") that something is wrong with that hive. So he examines them, and finds the combs a mass of webs, with hundreds of moth millers among the combs, and the combs themselves filled with vile worms. "Ah!" he says, "the bee moth has destroyed that swarm of bees;" when in fact the moth had no more to do with bringing about the loss than the maggots, found in the carcass of a nice lamb destroyed by dogs, had to do with destroying the life of the animal. "Oh," says some wise bee keeper, "I know better than that for I have seen the bee moth flying about my hives and trying to get in." Very well; I have seen the flesh fly circling about live animals, but think you there was any danger from them, as long as the animal was in health? Not a bit. Neither is there any danger from the bee moth, if you keep your stocks of bees strong and healthy. But if you have weak or diseased stocks, or have honey in boxes in warm weather unprotected by the bees, look out for the bee moth.

Fumigate with sulphur all combs taken from hives in warm weather; immediately after which, seal up closely in well-made hives or boxes, to prevent access by the moth miller. All combs taken out late in the fall, and kept through the winter in a place where they will be liable to freeze, may be sealed up so the moth cannot gain access to them, and the contents will keep safely through the next summer. Freezing destroys the vitality of the moth eggs. Fumigating with sulphur, as directed in "Care of Box Honey in Warm Weather," will de-

stroy the moth worms, and prevent damage to the combs, if they receive attention within a few days after the eggs are hatched; but if the worms are suffered to remain for any considerable length of time, the combs will be badly damaged, if not entirely ruined. In protecting honey or empty comb from the bee moth in warm weather, every bee keeper should recollect that eternal vigilance is the price of success! With the Controllable Hive and New System of Bee Management the true condition of stocks is known at all times. The stocks are very populous in July and August, which is the time the bee moth is most numerous about the hives. I never had a stock damaged by the bee moth since I adopted my present system of bee management.



CHAPTER IX.

ROBBING.

LOSS of stocks by robbing shows carelessness, or lack of knowledge as to the proper care of bees. Not one strong, healthy stock of bees in a thousand will be robbed, if proper precaution is taken. During a copious yield of honey there is very little danger of robbing. When there is a slack in the yield, the bees will search about for plunder, and if a weak stock is found, they will be very likely to attack it.

It is the duty of every intelligent bee keeper to know the exact condition of his stocks at all times, and if from any cause he has a weak stock, be sure to ascertain the cause of their weakness, and if they are healthy stocks, contract the entrances, in accordance with the number of bees to pass. But if they are found to be diseased, remove them. The bee, like the human race, is much better able to defend itself against the attacks of an enemy when there is but one avenue of approach, than if there are several.

No refuse honey should be placed in the open air, accessible to all the bees alike, as this would be very likely to create a desire to plunder, and incite robbing.

Never, when a stock is being robbed, change it from one stand to another, a few rods distant, to prevent robbing; for this is a very great injury to the stock, as all the bees that have marked the location (at the season when robbing will most likely occur,) will return to the old stand, and be lost. The best remedy, or rather preventative against robbing, is to contract the entrances to the hive. After bees have once commenced robbing, and have been successful in capturing and plundering one stock, they will, as soon as they have secured the honey from that one, attack some other with great impetuosity. Success in plundering renders them very courageous; but if you have contracted the entrances as directed, they will be very likely to meet their match, and learn a good lesson. A little punishment is necessary to teach them their proper place.

I knew one of these old wise-heads—such a one as spoken of in the chapter on “Swarming and Hiv-ing”—to use his familiar logic: “What he didn’t know about bees wasn’t worth knowing. He didn’t want any book larnin’ to know how to keep bees; he had allers kept ’em, and his father before him.” Well, this Mr. Wiseman found, or thought he had found, that his neighbor’s bees were robbing his stocks. “Zounds!” says he, “I’ll fix ’em!” So he goes early in the morning, before the bees are flying, and confines his stock, which he thought was being robbed, by nailing a piece of board closely over each entrance to the hive, so no bees could pass in or out. About sunrise, or a little later,

the robber bees begin to collect on the front of his hive, seeking to gain access. He waits until a quart or more have collected, and then he takes two or three quarts of boiling water, and dashes it upon them. This he continues through that day, and the next, at intervals, as often as there are any bees collected on the front of his hive. During this time he has killed more than a half bushel of bees. The third day he opens his hive, but to his great surprise, no bees appear, and on examination he finds the bees all dead. They had suffocated. Want of air, and the boiling water on the hive, had destroyed them. And to crown all, and make his loss still more severe, he found it was his bees that were engaged in plundering his stock, and his neighbor's bees had nothing to do with it. The vast number of bees slaughtered with the hot water, so reduced in numbers several of his stocks, that they never recovered, but fell prey to the moth-miller that season. And that was the way he "fixed 'em." There are so many whims and false notions about bees, that great care should be exercised in adopting plans recommended by inexperienced bee keepers, or that class who claim to know everything about bees, yet by their practice show that they know very little.

There is one other plan, aside from contracting the entrance, which will prove successful, but which is a little more trouble to apply. If you find a stock is being robbed, look them over, and be sure that they have a fertile, healthy queen. If the queen is found to be all right, but with few bees, take from

this hive two comb frames filled with comb, with no eggs or brood, and go to a populous stock and exchange these two combs for two others filled with brood. Select such as have most of the brood sealed over, as you want that which will hatch the quickest. Put these two combs in the hive that is being robbed, fasten up the stock by putting wire cloth over the entrances, giving then air, yet preventing the passage of bees.* When you put in the two frames with brood, if you find but little honey in the hive—not enough to last the bees a month or more—put in one frame containing honey. Put on the feeder and carry the hive to a dark and quiet room, and fill the feeder with pure, soft water. Let the bees remain in this room four days; then about one hour before sunset, set them on the old stand, giving them their liberty, with the entrances to the hive contracted—the lower entrance closed entirely and the upper one-half closed. Intelligent bee keepers will readily understand why this plan should prove a success:—First, the bees that hatch from the brood comb given the weak stock, will be a great encouragement to the few bees in the hive; and in a very few days they will aid in defending the hive against the attacks of robbers. Again—removing the hive from the stand seems to disorganize the robbers, for after they have visited the stand for several days, and find no plunder, they will give up the search in that direction.

*It is well to confine the bees when a large number of robbers are inside—a larger number if possible than the swarm itself, for being confined a few days, they will make that hive their home, and aid in defending its stores against other robbers with as much energy as the bees of the original swarm.

Before taking the trouble to remove a hive as here directed, care should be taken to be certain that the bees are being robbed. You can be sure whether it is your own bees or others that are robbing, by sprinkling them with flour as they come from the hive which you suspect is being robbed, and watching your other hives, to see if those you have marked enter them, being very careful that you are not deceived by the dust from some species of blossoms, which adheres to the body of the bee, and might be mistaken for the flour.

Bees when plundering a stock will often keep at their work until dark, some of them being unable to find their hive by reason of the darkness. Honest workers are not found abroad at that time, and by the way, this is a very good test of robbing. In concluding this chapter, I advise again: Know the condition of your stocks at all times. If any have too few bees, contract the entrances in accordance with that number of bees to pass. Preventative is much better than cure in this case.



CHAPTER X.

PROFITS OF BEE KEEPING.

TWENTY-FIVE years ago, and even at the present time, by the ordinary methods of bee keeping, if a profit of five dollars from one hive of bees in one season was gained, it was considered "good luck." You know there is no system in the ordinary methods of bee keeping. It is either "good luck" or "bad luck;"—all "luck" and "chance," anyway.

In one year they get five dollars profit from a stock of bees; the next honey season they get nothing, and the bees all die in the winter; or perhaps they will survive that winter, and the next season swarm, and fly away to the woods; or perhaps refuse to swarm, and remain idly clustered on the front of the hive throughout the entire honey season, and die from want of food before the winter is half gone.

Bee keeping by the ordinary methods is a very precarious and uncertain occupation. The profits are small at best, and losses large and frequent.

With my Controllable Hive and common sense System of Bee Management (as described in this work,) founded on correct and scientific principles, bee keeping is reduced to a science. There is no

“luck,” no “guess-work,” no “chance” about it. There can be no loss in bee keeping without a cause; there can be no gain without a full and correct understanding of the natural habits and requirements of bees. A correct knowledge of the subject insures success.

I will now present a few statements, exhibiting the practical results which follow the use of my Controllable Hive and New System of Bee Management, and showing the great contrast in profits and general success in the care of bees.

In the season of 1870, one of my hives of native bees yielded two hundred and fifty-three pounds of surplus honey, in glass boxes, from the 20th of May to the 1st of July. In 1875 one hive yielded three hundred and eighty pounds of surplus honey in glass boxes during the season. This was the largest yield I ever had, and shows what is possible by liberal feeding with a thrifty stock of bees, giving them every facility, with a view of securing the largest possible amount of surplus box honey. In this case, I selected in early spring, the very best stock I could find, and pushed it as hard as possible throughout the entire spring, summer and early fall. My success exceeded even my most sanguine expectations. As it may serve to aid others in producing large yields of honey, I will describe minutely the method pursued to secure this large and extraordinary yield.

Very early in the spring I selected the most populous stock in my possession. It was ruled by a young and exceedingly prolific Hybrid queen, a

mixture of Italian and Native blood. I commenced early in the spring to feed this stock lightly but regularly, every day at evening. I fed about one-half pound of feed per day, until a few days before the flowers were in bloom profusely. This was done to encourage breeding. Very early in the spring they were fed corn and rye meal, as directed in this work.

For a few days before the flowers were blooming profusely, I fed liberally—in fact, gave them all I could possibly induce them to take up; the object being to get the store comb in the body of the hive, not occupied with brood, completely filled with honey. The glass boxes, twenty-six in number (with the Feeder,) each holding about four and one-half pounds of honey, were arranged in connection with the hive (sides and top,) several weeks prior to the appearance of the flowers, that the bees might become accustomed to them, and the more readily enter them and commence work. When I ceased feeding (which was on the appearance of the flowers yielding a good supply of honey,) the boxes were filled with bees, and comb-building had commenced. The hive was at this time filled to overflowing with bees, and the combs had brood in all stages of growth, from the egg to the perfect bee. I had taken the precaution to cut out nearly all the drone comb, and fit in its place worker comb, so I had but very few drones to consume the honey. I had also arranged so as to have no increase by swarming, but to have all the bees employed storing surplus honey in the boxes throughout the season.

As fast as the boxes were filled, they were removed and empty ones substituted in their place. I never saw bees work with such determined industry, early and late, and in all kinds of weather. When honey failed at the end of the season, there was a set of boxes on the hive partially filled. I immediately gave the bees feed until these two were finished. I found, on weighing the product of this hive in the fall, that they had given me a fraction over three hundred and eighty pounds of surplus honey in boxes. This honey I sold at thirty-five cents a pound, a little over one hundred and thirty-three dollars, for surplus honey sold from this one stock. Reader, go thou and do likewise.

I had one stock of bees which occupied the same stand, winter and summer, for six years, and during that time they swarmed but once, and from it I sold every year over fifty dollars' worth of surplus honey in glass boxes. A neighbor several times offered me fifty dollars for this stock, early in the spring before the bees commenced their labors.

In 1874 I purchased a swarm of bees in an old box hive. They had not paid their owner a dollar in profit for years. Some seasons they would swarm and fly away to the woods; in other seasons they would remain clustered on the front of the hive through the entire season, refusing to swarm, or enter the two small boxes covered with a cap on top of the hive. I transferred the bees from this hive to the Controllable Hive, and they gave me a profit of over forty dollars the first year.

I sold my honey in 1874 for from thirty-three to

thirty-five dollars per hundred gross weight—that is, no tare deducted for weight of the box.

In the season of 1880 one stock in a Controllable Hive, in the month of June, without being fed or having extra care, yielded seventy-two pounds of surplus honey in glass boxes. Another treated in the same manner, yielded over eighty pounds surplus in the same time. Another new swarm, since the first week in June, filled the brood frames with honey, and produced thirty-eight pounds of surplus honey in glass boxes, (filling eight boxes as full as they could be crowded,) and gave me a large swarm the last week in June.

When box honey brings from thirty-three to thirty-five cents a pound, gross weight, my usual yearly average is a little over fifty dollars clean profit from the sale of box honey, from each stock of bees I keep. I intend to keep about twelve stocks each season. I sometimes have a much greater number; yet it is my purpose to keep only this number each season, for the production of surplus honey, swarms, etc. My average yield of surplus box honey is about two hundred pounds (perhaps a trifle less) from each hive of bees that I keep, during each season, when swarming is prevented and each stock liberally fed.

I will here give the testimony of a few of the many, who have adopted the plan of Bee Management recommended in this work. I should give the name and post-office address of each, were it not for the fact that they would receive so many letters of inquiry, as to make it very disagreeable to them.

I have the original and complete letters in my possession, and such letters I am prepared to show at any time. My object in presenting this testimony here, is to show that the system of bee management recommended herein is not only successful with me, but with all intelligent bee keepers, as well.

A gentleman from Vermont writes me under date of September 15, 1879, as follows: "I take this opportunity of informing you of the experience I have had with the bee hive received from you. About the 10th of May I transferred a swarm of bees from a box hive to the Controllable Hive. I transferred all the brood combs, and about eight or ten pounds of honey. I fed them until flowers were plenty, which encouraged them to build rapidly. About the 25th of May I put in surplus boxes on the sides, which they soon entered, and went to work. The middle of June I put boxes on top, as the bees showed symptoms of swarming. By the 10th of July the side boxes were nearly all filled, and the bees were at work in the top boxes. July 15th I took off sixteen of the twenty side boxes, well filled and capped, and placed empty ones in their places. August 5th, I took six of the ten boxes off the top, well filled. Then the dry weather set in, and the bees came to a stand still (thinking the honey season over,) but the bass wood revived it for a short time, enabling them to fill up the boxes pretty full. I obtained in all from this swarm twenty-eight boxes weighing one hundred and ten pounds. I shall have ten hives made this winter for use the coming spring."

A gentleman writes from New York, under date of April 2d, 1879: "I have received your hive, which meets my ideas of what a bee hive should be. It contains all that is required in a bee hive, or in other words it is just the thing I have been wanting. I have been using the Quinby hive, so called, but I am now going to keep bees in earnest on your plan. I have the fullest confidence of success with your hive and plan of management. Your plan for wintering is a good one, on scientific principles, and the arrangement for feeding and surplus honey can't be beat."

A gentleman writes from New Hampshire, under date of April 26th, 1879: "I have tested your hive, and my bees have done first-rate. I believe the hive is just what it is represented. One strong reason why I think so much of your hive is, there were not a dozen bees died in the hive last winter, while three of my first swarms in other hives all died—some of them with fifty pounds of honey in the hive. I have lost some winters as many as fifteen or twenty swarms. I have now tested your hive to my satisfaction, and I do not believe bees will die in it, if your instructions for wintering are carried out. I think your hive is what every bee keeper should have to make a success of bee keeping."

A gentleman writes from Missouri, under date of May 1st, 1879: "Your bee hive I like very much. I put in the swarm last season. They did much better than any swarm I had in the American hive. I took away more surplus honey than from

any of the others. I can recommend the Controllable Hive to all bee keepers. This spring I have put up fourteen more Controllable Hives, and shall use no other hive in future."

A lady bought a swarm of Italian bees of me in 1874, and from that one stock she increased to over twenty the third season, besides obtaining over one hundred pounds of nice surplus honey from the swarm I sent her in the first season.

Here I desire to be clearly understood. I do not wish to hold out inducements which will never be realized, for the purpose of causing any one to commence bee keeping with unreasonable expectations of profit. There is labor and care required to bring success in any enterprise; and usually the greater the care and labor bestowed on any business, the greater the reward in profits. Bees give ample return for each little care and attention bestowed upon them; and if neglected and permitted to go uncared for, there is corresponding loss. I believe that bee keeping on correct and scientific principles should be encouraged, until bees enough are kept to collect the honey now allowed to go to waste, and which, if collected, would add millions of dollars to the wealth of the country.

The statements of large yields of honey here presented, show what it is possible to do; yet no reasonable person would commence bee keeping with the expectation of realizing, on each of a dozen or more stocks kept, the large yields above specified. Some stocks will pay a much greater profit than others. And it is only under the most favorable


circumstances, with our very best stocks, that we secure the results here named, such as three hundred and eighty pounds of box honey from one stock in a season. This serves to illustrate what may be derived (but not what we may reasonably expect) from each stock, where a dozen or more stocks are kept. Two hundred pounds from each stock on the average is about right. And this last is only secured with good care and attention, perseverance and labor, judiciously applied to the work.

The question is often asked: "How many stocks of bees can be kept in one place on your plan?" This depends on the number of honey-yielding plants and flowers. Some localities furnish a much greater number than others. In some localities, fifty stocks would do well, and pay yearly a handsome profit; in others, it would not be profitable to keep half as many. I am in a place said to be very unfavorable to bee keeping. I find twelve stocks about the right number for me to maintain. Bees will go seven miles or more to collect honey, but the shorter the distance, the more honey will be collected, in a season; consequently the greater profit will follow.

It can only be learned by practical test how many stocks of bees may be profitably kept in any locality. Commence with a few, and increase the number moderately, until you find you have as many as you wish to keep, or as many as the locality will support, with good profit, when managed judiciously.

CHAPTER XI.

CHANGING OLD QUEENS FOR YOUNG ONES.

N my plan of bee management, if a stock does not change its queen for three years in succession, the fourth season the old queen should be taken away, if she shows the least sign of failing, and a young, laying queen substituted in her place. It often happens, if the queen in a stock dies or becomes seriously injured, that the bees will of their own accord, rear another to take her place. But if her failure has been gradual, the bees may not have the means to do so, when she at last fails entirely, for the reason that she may cease laying, for several days or weeks previous to her death, in which case it would be impossible for the bees, without assistance, to rear another queen to take her place. They must have an egg not over five days old, from which to rear a queen. The great necessity of close observation, in order to keep each stock always supplied with a healthy prolific queen, cannot be impressed too strongly on the mind of every bee keeper. Be sure not to neglect this very important point in successful and profitable bee keeping.

But very few seem to know the average duration of life of the honey bee. The average term of life

of the worker is only a few months—not more than from two to four—a great many do not live out half that time. So it will be seen that it is only by keeping healthy and prolific queens in each stock, that we can have populous stocks, such as will pay a good profit.

In my experiments I have in several instances taken from a vigorous and very populous stock their queen, and at the same time deprived them of the means of rearing another. This was done in the honey season. In such cases the bees kept on with their labor, though with visible reluctance and an appearance of discouragement, the number of bees decreasing very rapidly, and in from two to three months nearly all had disappeared, not more than two or three hundred remaining, where there had been from thirty thousand to fifty thousand all in a prosperous condition.

Other instances have come under my observation, clearly showing that the life of the worker honey bee is only of a few months duration. One case in fact will show: I removed the native queen from a very strong stock of native or black bees, in the honey season, and introduced an Italian queen, in order to change the stock from native to Italian. The reader will readily understand that every egg deposited by the Italian queen, after her introduction, will produce the Italian variety, the workers of which are entirely distinct in color from the natives. In a few days after the introduction of the Italian queen I found the natives were disappearing, and soon after the Italians began to appear. The

change was very rapid. In about two months not a native or black bee could be found about the hive—all were Italians. The natives had gradually decreased, until all had disappeared, showing conclusively that they had died in the same ratio that they would have passed away from a stock naturally. During the winter season, as the bee is in a dormant state for the greater part of the time, they are given a longer lease of life.

When it is discovered that a stock has a barren queen, or has lost its queen, or from any cause she has ceased to be prolific (and in consequence the bees are dwindling away,) take means immediately to substitute a prolific and healthy queen in her place, and at the same time re-enforce the stock, by taking one or more frames filled with hatching brood from a populous stock, and exchanging for those destitute of brood. In this manner the bees will be increased so as to insure safety for a few days, after which the stock, having been furnished with a prolific, healthy queen, will regain their former prosperity and vigor.

The queen being the mother of the entire swarm, and consequently all increase being dependent on her, every intelligent bee keeper will readily understand that in order to succeed, he must be sure that each stock has a prolific queen.

CHAPTER XII.

REARING AND INTRODUCING QUEENS.

IN commencing to rear queens, you will first want some small rearing boxes, or miniature hives, about four and one-half inches wide, by eight inches long, and five inches deep, inside measurement. Use inch board for the hives. Make for each hive three movable comb frames,* suspended the same as in the brood section of the Controllable Hive. Make the under side of the top bar flat, instead of triangular, as in the large comb frames. Take a piece of old comb, and cut to fill each one of the small frames. Take from a pint to a quart of bees in a populous stock (in the height of the breeding season this will do harm) without the queen. Confine the bees in a light box, in the top of which there is an inch hole, closed to confine them to the box, for if not confined they would return to the old stock, as the queen is not with them. Having secured your bees in the box, go to a stock, and lift out a comb containing eggs, just deposited. They may be known by their appearance. They are but a tiny speck at the bottom of the cell, about one-sixteenth of an inch in length, slightly curved,

*This frame is shown in the engraving, representing the different kinds of cells, in Chapter I.

and perfectly white in color. They remain in this form two to three days, at the end of which time they change to the form of a grub or maggot. After this change it is a risk to depend on them for queen raising, so be sure to secure for your purpose eggs. Cut from the brood comb a piece about two inches long and one-half inch wide, using a very sharp, thin knife, so as not to mutilate the comb. Cut out a piece from the center comb of the miniature hive, and fit in its place the piece containing the eggs. The middle of a warm day is the best time to do this work. It is best to have one of the comb frames of the miniature hive filled with honey, to furnish food for the bees for a few days.

As soon as you have fitted the piece containing the eggs in its place in the miniature hive, put on a close-fitting cover. Do not nail it as you will want to look at it every few days. Close the entrances to the miniature hive, so no bees can escape. Now open the hole in the top of the box in which the bees are confined, and set the miniature hive containing the eggs over it quickly, allowing no bees to escape. The bees will then pass from the box up into the miniature hive, cluster on the comb containing the eggs, and immediately commence the rearing of queens from the eggs thus furnished them. Keep the bees confined to the miniature hive for about thirty-six hours. Give them their liberty at first about one hour before sunset. If you do not confine them for the time stated, they will return to the hive from which you took them, but if so confined, they will forget their old home, and adhere

to the miniature hive, the same as an ordinary swarm hived in the usual way. They will rear queens from the eggs given them by constructing queen cells, so arranged as to take in one of the eggs in the piece of comb furnished them, often constructing three or more cells. In about six days, open the miniature hive, and you will find these cells nearly or quite finished. Occasionally a case occurs where they do not rear queens when thus furnished with the means, but such cases are rare. If you find each one made separate, you can, if you choose, with a sharp, thin knife cut out all the cells but one, and give them to other rearing boxes not supplied with eggs, or which have failed to rear queens from the eggs furnished them. If you leave all the cells in the miniature hive as constructed, the first queen that hatches will destroy all the others. She will visit each cell, gnaw an opening in the side, curve her abdomen and insert her sting into the opening, and sting the rival queen to death while yet in her cradle. The worker bees will then enlarge the opening, and drag out the lifeless body. The victorious queen now reigns over the little colony, the same as in a large and natural swarm.

In from three to five days after hatching if the weather is fine, the young queen will leave the miniature hive, and take a flight in the open air, to meet the drone for the purpose of fecundation. If successful, she will commence to lay in about two days. She may then be introduced to a full stock at any time desired. Recollect it will be useless to rear queens where there are no drones.

When stocks are liberally fed early in the season, drones will appear correspondingly early. And if from a stock well supplied with drones, you remove the queen, the workers will not destroy the drones in that hive until they have obtained another fertile laying queen. With this idea in view, viz :—early and liberal feeding to produce drones early, and depriving a populous stock (well supplied with drones) of its queen the last of the season, we can have drones sufficient for our purpose from early spring until late in the fall.

I have in several instances, for the purpose of securing drones very early in the spring, deprived a populous stock, containing a large number of drones, of its queen, very late in the fall, and wintered them queenless. In this manner the drones were permitted by the bees to remain and winter with the swarm. Early in the spring they were re-enforced with hatching brood from populous stocks, but were permitted to rear no queens, in order that the drones might be preserved. As soon as drones appeared in the other stocks, this stock was furnished with a laying queen and it was as prosperous as the best.

By this plan drones may be kept through the winter, if their services are required very early in the spring, before we can raise them from the best stocks by judicious feeding, which very rarely can be done. The bees for rearing queens are usually obtained from populous hives, such as will hardly miss a pint or a quart from their numbers, great care being exercised not to remove the queen. The

best time to get the bees is in the middle of the day. Go to a stock and first find the queen. Set the comb she is on to one side. Put your light box (prepared as before described with a hole in the top) on a sheet near by, with one edge raised an inch. Take one or more combs from the hive (being careful not to get the one with the queen,) and shake the bees from them, down beside the box, which they will readily enter. When you have bees enough in the box, close it so none can escape. You now have the bees ready to put in the miniature hive, as before directed.

I think I have given such instruction as will enable any one, after a little practice, to rear queens successfully.* I will follow it with such information as will insure success in introducing queens into full stocks of bees.

Here let me caution bee keepers never to attempt to introduce a queen into a full stock of bees, until she has begun to lay. A young queen, not fecundated, will be destroyed in nine cases out of ten, in spite of every precaution. Before introducing a queen, the old queen in the stock, if any exists,

*By taking brood for rearing queens only from such stocks as exhibit the greatest industry, mildness of disposition, vigor in withstanding the cold, etc., I find I am able to greatly improve the desirable qualities of my bees from year to year. This systematic course of treatment has produced swarms possessing very valuable characteristics. It is surprising to note the difference in profits and ease of management, between bees that have always been left to take their own course, and such as have had their most desirable traits cultivated and improved to the greatest possible extent for a term of years. The difference is almost as marked as between the savage in his native wilds, and the most intelligent and highly educated member of society.

must be taken away. Make your search for her in the middle of the day, as at that time most of the workers are away. Use but very little smoke, and that only at the entrance, as the bees should remain spread over the combs as evenly as possible. If you use much smoke they will rush to the bottom and the corners of the hive, and it is very likely the queen might seek a hiding-place with the others, where you could not find her. If not disturbed, the queen will be found in the comb among the bees. When ready to proceed, having smoked them lightly at the entrances (a puff at each entrance is sufficient,) lift out the comb carefully, avoiding any jar, and look them over for the queen. It is said the Italian queens are more readily found than the natives, but I could never see any difference. Hold the frame up in front of your face, so as to have a good view, and look each comb over carefully till you find the queen. When found, remove her. Always return the combs so they will occupy the same position as before.

As soon as the queen is removed, and the bees are aware of their loss, they will usually commence to rear another queen from the worker eggs to take her place. To make a sure thing of it, they often start to produce a half-dozen or more.

In six days after removing the queen, smoke the bees well, to get the combs as clear of them as possible. Do this in the middle of the day. When you have driven the most of the bees from the comb to the bottom and into the corners of the hives, lift out the combs, and look sharply for queen cells,

(success depends on thorough work here.) With a sharp knife cut out and destroy every such cell that is finished or commenced. Don't leave any part of a queen cell in the hive, for the bees will not accept a strange queen if they have the means of raising one of their own. Having destroyed every queen cell, finished or unfinished, return the combs to the hive; but before putting the honey board over the brood section, cut a hole in it a little smaller than the top of a tumbler. Cover this hole with a light piece of board, simply laid on, (not nailed, for you will need to remove it without jar.) Then put the honey board in its place over the brood section.

Let the hive remain until near sunset, for the bees to get quiet, and to learn that they are without a queen and without the means of rearing another. Just before sunset, take the queen you propose to introduce, and with her a score or more of workers, and put them in a tumbler with a piece of wire cloth over the top to keep them in. (To get her from the miniature hive, where she was reared, to the tumbler, take it to a close room, before a window, so if she takes wing she may alight there.) Go to the hive into which she is to be introduced, and remove the cap, avoiding any jar that may irritate the bees. Take off the board over the hole in the honey board, and turn the tumbler containing the queen bottom up over it, keeping the wire cloth between the queen in the tumbler and the bees in the hive. Replace the cap to the hive, and let the queen and her attendant bees remain in the tumbler, in communication with the bees in the hive through

the wire cloth, until the next day, near sunset. Then take a teaspoonful of honey, go to the hive, and remove the cap, this time with the greatest possible care, as the slightest jar will endanger success. Raise the tumbler carefully from off the queen, and with the honey smear her completely over, then turn the wire cloth over carefully, and let the queen and her attendant bees down through the hole in the honey board, among the bees of the hive. Replace the cap as quietly as possible, and the work is done. In about one week examine the combs of this hive for eggs, and if they are found, you can consider your work crowned with success. If no eggs are discovered, you must go over the ground again. But be sure there are no eggs in the combs before you repeat the work.

This plan of introducing queens, is the most successful of any I have ever tested. It rarely fails. When a laying queen is removed from one of the miniature hives, the bees will usually rear queens from the eggs left when the queen is removed.



CHAPTER XIII.

SOURCES OF HONEY.

THE sources from which bees collect honey are various and almost innumerable. Almost every flower, tree, plant, shrub and vine, in field, forest, pasture and garden yield honey to some extent. White clover is, perhaps, the greatest source of honey in the New England and Middle States, it being found in a greater or less extent in almost every field and pasture. South and West there is, in many localities, a profusion of wild flowers, producing considerable quantities of honey. In some sections buckwheat affords a rich harvest. Basswood yields a very nice quality of honey, and in sections where it abounds, great quantities are collected from it. Fruit blossoms—apple, pear, peach and all the different varieties of plums, cherries, etc., are very important sources of honey.

Pollen is the first material gathered by the bees in early spring. Several varieties of alder, willow, red maple, etc., produce pollen in great abundance. Raspberry, blackberry, catnip, dandelion, etc., all contribute largely of honey in their season. Corn and most kinds of grain furnish pollen in abundance late in the season. Mustard and sweet clover are great favorites with the busy bee, yielding the most

beautiful honey, clear as a crystal and white as snow. The sugar maple produces honey of excellent quality, and where forests of this tree abound, large quantities of honey are stored, while it is in blossom in early spring.* Locust, whitewood, mignonette, golden rod, sumach, etc., all produce honey. When we take into consideration the fact that the bee will go seven miles or more to collect his sweets, it is easy to understand that a certain number of swarms will succeed in almost any locality, even without feeding. To make this still more clear, we have only to take into account the vast number of honey yielding flowers, trees, plants, shrubs, etc., within a circle of fourteen miles in diameter, the hives occupying the centre, and the bees flying to collect honey seven miles in every direction from the hive. Those who have not tested the matter, will be likely to dispute the statement, that a bee will go seven miles to gather honey. But on this point I am able to offer ample proof, to establish, beyond a reasonable doubt, the fact that the Italian bee will go that distance. The proof I offer is this: The first Italian bees brought into the New England States, I had the honor of receiving. The Italian bees being entirely distinct from the native or black bees in color

*Climate and soil are so variable, it is impossible to give the sources of honey so as to apply minutely to every locality. I shall strive to designate the principal sources. The bee keeper will very soon learn from experience and observation, what are the principal sources of honey in that particular locality. Many different flowers, trees and shrubs are found in one section yielding honey profusely which do not exist in another.

or size, I determined to avail myself of the opportunity offered to satisfy myself on the long-disputed question—"How far will a bee go to collect honey?" I therefore made close and repeated examinations, at different times during the honey season, and it was no uncommon occurrence, to find the Italian workers seven miles from their hives. As there were no Italian bees except mine within hundreds of miles, I considered this positive proof that this variety will travel seven miles from its hive in its search for honey-producing flowers. As the native or black bee is, to some extent, found in all parts of the country, it is impossible to prove conclusively the distance they will go from the hive; yet my observations give very strong evidence that they journey five miles or more after honey.

When the distance a bee will go for honey is so well established, and having found from repeated tests that the flowers, when yielding honey, may be visited many times each day by the bee, and yield at each visit a bountiful supply, we can form some idea of the vast amount of honey now permitted to go to waste, which might be collected by bees, stored in nice boxes, and thus add wealth and enjoyment to the human family.

The question is often asked, "Which is best for bees, a wet or dry season?" I think either extreme of very wet or very dry season is bad. A warm, medium wet spring, followed by a summer of light and frequent showers, will usually give a good yield of honey; while a cold, wet, or a cold, dry

spring, followed by a dry or very wet summer, produces a light crop of honey from flowers.

The bee keeper sometimes finds his bees idle, when the flowers are in bloom in profusion, the sun shining brightly, and to the superficial observer, everything indicating honey in abundance. And yet the bees are dormant, and scarcely a one flying about the hives, notwithstanding the hives and boxes are full of them. The truth of the matter is, there is no honey in the flowers, although they are in full bloom. The air is dry and clear. Suddenly there is a change, the atmosphere becomes moist and charged with electricity, with occasionally light showers. Immediately all is activity about the hives. The greatest show of industry is manifested; scores of workers, and in some cases a hundred, coming into each hive every minute, loaded with honey, many of them so heavily weighted that they fall to the ground before they reach the hive, where they rest a moment, and then try again, usually succeeding in entering with their load. I have seen a change, as here described, brought about in a half-hour's time in the middle of the day, viz: The bees pass from an idle, almost entirely dormant state, to the greatest activity and industry. And all because a change in the atmosphere had caused the flowers to secrete honey. The question arises—How did the bees know at that particular hour there was a change, and that the flowers, which a few minutes before were destitute of honey, were now bountifully supplied? I answer, the bee was aware of the change almost the moment it took place. The bee

is very sensitive to all atmospheric changes. A case in point will show this: The bees are collecting honey abroad in the fields. The day is warm and balmy. Suddenly there is the appearance of a shower, and distant thunder is heard. Immediately the bees come rushing in from the fields, in clouds. They cover the entire front of their hives, in their eagerness to gain a shelter from the approaching rain. Again, if the morning is cloudy and dark, with every appearance of rain, and you find the bees leaving their hives for the fields, you may be quite certain that rain is not near, and may expect soon to see the sun break forth and the clouds disperse. If on the other hand there is an appearance of rain, and the bees are quiet in their hives, it is quite sure to rain in a very short time. How wonderful are the workings of nature. How great the sagacity of the little, busy bee. Who dares say that this wonderful little insect does not possess the power of reasoning? But I am digressing from the subject.

Bees, in their journeys to collect honey, seldom visit more than one species of flower, plant or shrub at one excursion; and this is a wise provision of nature, for were it otherwise, and any and all species visited promiscuously, the vegetable world would be thrown into chaos, by the fertilizing dust of one species being imparted to another, through the medium of the bee.

Pollen as fast as collected is deposited in little basket-like cavities on the inside of the bee's posterior legs. It is packed in little pellets, varying in

size from that of a pin's head to a small pea. In color it is usually yellow, but sometimes green or red. Hundreds of bees may be seen entering the hives, with pollen, at almost any time in the honey season, particularly in the morning before the dew is off the grass. It is easier for the bees to collect it at this time, as the moisture causes it the more readily to adhere to the cavities of the legs. Honey when collected is deposited in the stomach of the bee, in which it is borne to the hive, and there deposited in cells in the comb. The bee has the power of raising this honey from its stomach, in the same manner that all ruminating animals raise the cud.

Some have contended that bees cause an injury to all kinds of fruit, such as apples, peaches, plums, etc., by taking away the substance and sweetness, in the form of honey, which otherwise would be absorbed, and eaten with the fruit. This is a great mistake. The provisions of nature are wise in this respect as in all others. There is the strongest evidence to prove that honey, once secreted in the cups of the tiny blossoms, never returns to the flower or fruit, but evaporates and passes into the air. Who, in passing an apple or peach orchard in full bloom, has not noticed the delicious fragrance; which is undoubtedly honey, which has evaporated from the myriads of blossoms. It is very plain to the close observer that nature has placed in the cups of flowers this honey, expressly as food for the honey bee, and that it is in harmony with all her great and wonderful works.



HOME APIARY OF MRS. LIZZIE E. COTTON.

CHAPTER XIV.

LOCATION OF HIVES.

IN locating your hives, place them on the south side of buildings, or a close board fence facing south, south-east or south-west. If possible, locate in the shade of trees, where they will be shaded from the sun from nine o'clock in the forenoon until one in the afternoon, or a little later. If no trees afford shade, arrange a roof over each hive, which shall shade the entire hive, and especially the front, in the summer season. But in spring and fall it is better to let the bees have the full benefit of the sun's rays, shining directly upon the hive. Construct a separate stand for each hive, as follows: Cut boards about three feet long, and joists three by six inches square (two pieces of the latter two feet long;) nail the ends of the boards to those pieces, so as to form a stand, when placed on the ground, three feet long, two feet wide and six inches high. This gives a free circulation of air beneath the stand. Set your hive on this stand, the rear of the hive even with the rear of the stand, which leaves the stand projecting a foot or more in front, making an admirable place for the bees to alight before entering the hive. Set your stands three feet apart, and make them perfectly level before placing your hive upon them.

Place an alighting board in front of each hive. Get a board about eighteen inches wide and two feet long. Nail on some cleats at each end, to prevent warping. Rest one edge of this board on the ground, the other edge on the end of the platform in front of the hive. By this arrangement many bees will be saved in early spring which would otherwise be lost. By the old plan of setting the hives two or three feet high, with no alighting board, and a free draught of wind beneath, the loss of bees was very great, especially in the early spring months, on chilly afternoons following a very warm forenoon. The bees, returning loaded with pollen, are unable to reach a hive placed so high, and are blown to the earth by the hundreds, and becoming chilled, die. The death of a few bees is a great loss in early spring, for they are required in keeping up the animal heat in the hive to forward breeding.

The location of bees as here recommended will be found greatly superior to any other, for other reasons than those mentioned, and which are too numerous to herein specify.

Every one who commences bee keeping should ever remember, that bees always mark the location of their hives. The young bee the first time it leaves the hive invariably does this. The same is true with all swarms, in the first flight in early spring, after being dormant in the hive through the winter months.

In marking the location, the bee comes from the hive, and at the entrance, rises on the wing. Turn-

ing its head toward the hive, it recedes in circles, backward, at first describing a circle so small as to be scarcely perceptible, but enlarging as the distance from the hive is increased. They thus take into view all objects surrounding the hive, so that they are able to return to their own hives without difficulty. After one or two excursions begun in this manner, the bee leaves the hive in a direct line for the fields, without taking any further precaution whatever, and returns by its knowledge of the objects in the vicinity of the hives, without difficulty.

Notwithstanding there might be a hundred hives standing in a line, with only a few inches space between each, and all of the same color and appearance, if left to itself no bee would enter the hive of its neighbor, although there might be hundreds of thousands of the busy workers from all the hives, flying promiscuously about in the air. Each bee knows its own hive perfectly, and if from any accident it enters its neighbor's house, immediate death is usually the result; or possibly it may escape, after being roughly handled, and made to understand that it is trespassing on forbidden ground.

Some bee keepers, with little knowledge of their occupation, often remove a hive of bees several rods, in the working season. The result is, all the bees that had marked the location (and all the old bees had done this) are lost. They would continue to leave the hive in a direct line, after its removal, not taking the precaution to mark the location, as they were unaware of the change, and when they were ready to return they would return to the former place

Bees may be safely moved a dozen miles or more, at any time, as this takes them beyond their knowledge of country ; but in such cases set the hives six feet apart at least. If this precaution is not taken and the hives are set close together, the bees will rush from the hives on being let out, not knowing the location has been changed, and when they return, many will enter the wrong hive, and be slaughtered without mercy.

Therefore let stocks be placed, early in the spring before they have marked the situation of the stands they are to occupy for the summer, and not change them after the bees have commenced their labors—at least change them no less distance than twelve miles.



CHAPTER XV.

WINTERING BEES.

THE subject of wintering bees is of the greatest importance, and one which is generally very imperfectly understood, if we may judge from the large number of swarms lost every winter and spring. There are many methods recommended as "the best" for wintering bees. One will tell you to keep them cold; another to keep them warm. One will say, put them in the cellar; another, bury them in the ground; another put them in the attic. Is it any wonder that the beginner becomes confused and disgusted at so much conflicting advice? That bees have been wintered safely by any and all of these old plans I shall not dispute. But I am certain that neither plan will, alone, prove successful in the majority of cases.

By all the methods heretofore recommended, a large number of bees die from each stock, during the winter; so reducing them in numbers that it takes nearly the entire summer for them to regain in numbers what they have lost; while a very large number of stocks are lost entirely.

It will be readily understood that the greater the number of bees in a hive in early spring, the more warmth will be generated; consequently the more

rapidly will the brood mature and the bees increase in numbers. It is of the greatest importance to have strong stocks in early spring. This is one of the strong points of the new system of management, taught in this book.

In nearly all the hives now in use, there is no proper ventilation, consequently the honey in such hives becomes sour, the comb mouldy, and the bees diseased. It is impossible, in our variable climate, to winter bees successfully for any number of years, with any degree of certainty, in the great majority of the ordinary hives.

Some, who have met with heavy losses in winter, have taken the ground that the loss was caused by a poor quality of honey, stored by the bees in a wet season, or a large yield late in the fall. But this is a great mistake. Bees will not collect and store honey not suited to their use as food; they make no mistakes on this point.

I might discuss in detail all the different methods of wintering bees, and show the great losses attending each, with causes, etc., but by so doing I should consume more space than I can give in this work. I shall therefore confine my remarks to ordinary conditions of bees in winter, and the requisites to insure uniform success in wintering.

In the winter, bees cluster as closely together as circumstances admit, and the severity of the cold demands. The more severe the cold, the closer they cluster together, in order the better to keep up the animal heat necessary to maintain life.

By all the old methods, the cluster of bees is di-

vided by the sheets of comb, which is a great hindrance to successful wintering. In such cases the bees cannot cluster compactly together, but are spread out between the different sheets of comb. In the Controllable Hive, and on the plan of wintering here recommended, the bees in very cold weather cluster in the space between the wire cloth of the ventilator and the top of the frames of the brood section. They are here able to keep up the required amount of animal heat, as they can cluster compactly, without anything to separate them.

By the ordinary plan, in sudden turns or very cold weather, the bees between the outer combs are often frozen to death. "Oh!" says some one, "that's all humbug; you can't freeze a bee." Certainly you can. To satisfy yourself of this, after a very cold turn of weather, look under your box hives, if you have them, or any patent hive having a loose bottom board to admit of an examination, and see if you do not find hundreds of bees which have fallen dead from the outside combs. I have examined hundreds of stocks, and found them as here described. If you don't believe a bee will freeze, take out a dozen from a hive, in a severely cold spell of weather in mid-winter, confine them in a box, and set them out doors, letting them remain only one night. See if they are not dead beyond resuscitation, the next morning. This notion that bees will not freeze, is a great mistake, and has led to some very foolish experiments in wintering them.

A swarm of bees of average size, put in proper condition for winter, will not freeze; but from this

it does not follow that a bee is proof against the greatest possible degree of cold. When bees are prepared for winter, as herein directed, they will, as before stated, cluster compactly together. And as the cold increases the cluster will contract, in accordance with the increasing of the cold, and consequently no loss of bees occurs.

Another great cause of loss in winter is improper ventilation, or no ventilation at all. Every swarm of bees throws off a considerable amount of moisture from their bodies. In very cold weather, if the hive is not properly ventilated, this moisture collects on the combs at the sides and top of the hives, in the form of frost and ice. In moderate weather this frost and ice melts, and runs down into the hive, completely saturating the bees, and then, if a sudden change to extremely cold weather takes place, all are destroyed by freezing; or if they chance to survive the winter, the moisture causes the combs to mould, the honey becomes sour, and thin like water, rendering it unsuitable food for the bee, and bringing on diseases—dysentery, bee cholera, foul brood, etc., and in a short time the bees are all destroyed. Thousands of good swarms are lost every winter by improper management, and from being kept in hives not suitable for wintering. I give directions for wintering on my plan, in *Controllable Hives*, and I feel confident, if directions are carefully followed, that many stocks will be saved annually, which otherwise would have perished.

HOW TO WINTER BEES IN CONTROLLABLE HIVES.

Bees are wintered in Controllable Hives on their summer stands, by my plan, without loss, by maintaining an even temperature in the brood section, and disposing of all moisture or perspiration thrown off by the bees in cold weather. I have never lost a swarm of bees in Controllable Hives in the winter. I attempt to winter none, except strong, healthy stocks. I have no mouldy combs, no sour honey. The combs are kept perfectly dry, and the hives in a healthy condition. I do not lose a teacupful of bees, on the average, from each of my hives during the winter.

To winter in Controllable Hives, prepare as follows: At the commencement of steady cold weather, which, in the New England States, is usually near the close of November, put the bees in condition to winter by entirely closing the upper entrance to the hive, and the lower one shut up about one-half.* Take out the box frames at the sides of the brood section, and put the movable partitions in place. Remove the boxes and feeder, or honey board (whichever is in place,) from over the brood section. Place the ventilator (described elsewhere) over the brood section, so the lower

*To secure a slight upward draught of air, to carry off the moisture arising from the bees, make a hole a half-inch in diameter in front and rear of the cap, in the center, close to the top or roof boards. (And here let me say, the roof boards, or boards covering the cap, should project about an inch, as they can be more firmly nailed, and make better joints; for driving rains must not be allowed to penetrate to the inside of the hive.) The inside of each hole should be covered with wire cloth, to keep out insects, etc.

edge of the ventilator, at the sides, will rest on the upper edge of the movable partitions, on each side of the brood section. Pack the sides of the hive (that part occupied by the side boxes in summer) closely with very fine hay or straw. Pack the cap as full of the same matter as it can be crowded. Then put the thickness of one or two inches over the ventilator, filling up evenly, so when the cap is placed over the upper part, the cap and sides will be compactly filled. There must be no spaces left unfilled, the object being to secure an even temperature in the brood section, and absorb all moisture thrown off by the bees; and to do this successfully, the cap and sides must be closely packed throughout. When you have the cap and sides well packed, replace the cap, and the work is done. Shade the front of the hives during the winter months. No matter if the snow drifts over the hive so as to completely bury it from sight, let it remain;—your bees are safe.

A neighbor of mine had fifteen stocks in Controllable Hives completely buried in snow over six feet deep, and the crust formed over them so it would bear a horse. They remained under the snow, from January until April, when they thawed out, and every stock was found to be in first-class order.

When there is only a small quantity of snow about the hive, say only enough to cover the lower entrance, and there should come a very warm spell of weather, which would bring the bees out, be sure to clear away the snow so they need not be kept back by it. But it will take an exceedingly

warm day in winter to rouse the bees from their dormant state in the Controllable Hive and bring them out for a turn in the open air. If the air is warm enough to induce them to come out, it is always warm enough for them to fly briskly. In this respect there is a great contrast between my hive and others. With other hives, an hour's warm sun will bring out the bees in winter, when the air is cold, and the consequence is, they fall into the snow and perish by hundreds. In this way stocks are often reduced in numbers until all are lost. The dysentery generally attacks such stocks (brought on by the sudden changes in temperature in the hive,) and hastens their destruction, by causing them to leave the hive, when they would not do so if in a healthy condition. Bees when wintered in Controllable Hives as directed, will come out in the spring, strong in numbers, and in a healthy condition—in great contrast to the weak and diseased stocks which have been wintered in the ordinary manner. I have perfect confidence in the method of wintering here recommended, for I have had it in practical use for many years, and have never lost a stock, notwithstanding some winters have been very destructive to bees in this section; some, who practice the old methods, losing their entire stocks. I learn from my correspondents in all parts of the United States that there is great loss of bees in winter; so great in fact as to discourage many from attempting to engage in apiculture.

My plan of wintering is very simple, and commends itself to every intelligent person. In a few

words it may be expressed thus: The brood section is secured against the effects of sudden changes in the weather (this keeps the bees dormant throughout the winter season, which is as nature designed,) and provides for the absorption of all moisture and perspiration arising from the bees, while in a dormant state. These two points are the foundation of successful wintering.



CHAPTER XVI.

TRANSFERRING BEES.

AS some of my readers may have bees in ordinary hives, which they would like to transfer to the Controllable Hive, I will devote a chapter to Transferring.

If you have bees in a box or patent hive, or any of the thousand and one bee hive humbugs, which are of little or no profit, and cause you much trouble and perplexity in swarming time, and frequent and heavy losses in winter, you can move them into Controllable Hives—comb, honey and bees together and manage them on the plan here recommended, and they will winter well, come out strong and healthy in the spring, and cause comparatively no trouble in swarming time, yielding you a good profit yearly.

The best time to transfer is as early in spring as the weather becomes warm enough to keep the bees active every day, which in the New England States, is usually in April. It is a good time to transfer about twenty-four days after the first swarm issues from a stock, as at that time there is but little brood, and usually but few bees. October is a very good time to transfer, but not as good as either of the times before mentioned. Great care is required

to prevent robbing, and also to have the comb frames all filled with combs. and in good position for the bees to winter. As cold weather is so close at hand, the bees will have but little time to arrange for winter.

In transferring, construct the Controllable Hive as directed, with exception of the comb frames, from which leave off the triangular piece, as the comb can be better fitted to a flat surface. Make several holes one-fourth inch in diameter through the top, bottom and ends of frames, and a like number of sharp wooden pins about two inches long to fit these holes.

Early in the morning, before the bees begin to fly, prepare your smoker, go to the hive you propose to transfer, and before you touch it, smoke the bees at the entrances moderately, giving them two or three puffs, waiting about a minute and giving them two or three more. Then stop the entrances, so no bees can escape. Take the hive from the stand and carry it to some out-building, so the bees from the other hives will not trouble you, and get a taste of the honey, thereby inciting them to robbery. Turn the hive bottom up, and with two sticks each about a half-inch in diameter and twelve inches long, strike the hive lightly half a dozen times, and then wait for two or three minutes. Then with the sticks on each side of the hive drum briskly (but lightly so not to break the comb,) for about five minutes. Then puff smoke under the bottom board on all sides. Much of this preliminary work is for the purpose of confusing the bees, and inducing

them to fill themselves with honey from the cells of the hive, as a bee gorged with honey will never volunteer an attack for the purpose of stinging. The bees are now ready to be transferred. You will need some one to assist you, and it will be necessary for you to put on your articles of protection, and keep your smoker in readiness for use, as occasionally a swarm is hard to subdue, though the great majority of them are perfectly docile after the treatment recommended. But we are to "beard the lion in his den," and to be forewarned is to be forearmed.

The bees usually manifest their submission by a loud humming noise. If after you commence operations (before you get the side of the hive off) they show a disposition to be cross, replace the bottom board, close the entrances, if open, and give the insects a good smoking, at the entrances, and by raising the bottom board enough to introduce the smoke; give them the smoke freely for several minutes. Then again remove the bottom board. (These directions apply to the common box hive. If hives of a different pattern are operated upon, vary the operation to conform to the requirements of the case, applying the same principles.) Then with a chisel and hammer remove one side of the hive (the side to which the bees have attached the least comb,) and with a thin, sharp table-knife, cut the edges of the comb from the sides of the hive. It is well to have a table or stand near by, with a cloth folded in several thicknesses, on which to lay the sheets of comb with the bees adhering, if neces-

sary. The cloth prevents crushing. Cut out a comb from the hive with the bees adhering, and cut off the edges, if required, so it will fit the new frame closely at the top and bottom. No matter if it does not go the whole length of the frame from front to rear, as the bees will finish it.* Have the comb occupy the same position, relatively, in the new hive, that it did in the old. When the comb is in place in the frame, secure it by putting the wooden pins through the holes in the frames into the combs, and having fastened it firmly in place by means of the pins, place it in the Controllable Hive in its proper position.

Thus proceed, till all the frames of the Controllable Hive are filled, or the comb in the old hive is exhausted. In transferring, very old, black combs should be discarded, even if you do not have your new hive more than half full. Get all the bees, if possible, in the new hive, and when you set it on the stand, close the lower entrance entirely, and let the upper one remain only one-half open, for a few days, until the bees get well located in their new home. Be careful not to crush any of the bees, and take special care not to injure the queen.

As you will probably complete the operation of transferring at about the time that bees will be flying briskly about the other hives, it will be better to put wire cloth over the entrances, to confine the bees you have transferred, and let them remain in the out-building until about an hour before sunset ;

*But very few hives are large enough for their combs to fill the movable comb frames of the Controllable Hive.

then set them on the stand and give them their liberty. Keeping them shut up for the time named, gives them a chance to take up the honey which runs from the transferred combs, and which might, if the bees were carried immediately to the stand, incite robbing.

Transferring is by no means so formidable an operation as at first appears. I have transferred a very large number of swarms from the old box hives, without protection for hands or face, and now the bees seldom show any disposition to sting. Yet I would advise beginners to protect themselves, until by practice they become familiar with the work. "Practice makes perfect" is an old and true saying, and it applies to all operations with bees, I assure you. In my first attempts at this work I thought I must be protected, and I would not for the world proceed without a protector, and that of the most invulnerable kind. Now, having had much practice, I feel no necessity for any covering whatever. I trust I have made my method of transferring perfectly plain, so that all who wish may avail themselves of its advantages.

CHAPTER XVII.

ITALIAN BEES.



Italian Queen.



Italian Worker.



Italian Drone.

THE Italian bee is a native of the Alps, and was first imported to this country about the year 1860. The Italian being a native of mountainous regions and a high latitude, they were reported to be extremely hardy and vigorous. Those who were first to obtain them, were unanimous in their praise of the Italian bee, and fully agreed that it was superior to our native or black bee in very many respects. The good reputation which preceded the introduction of the bee to this country, by time and experience in their care, has been fully vindicated.

The pure Italian bees are superior to the natives in the following characteristics: They are more hardy and vigorous, withstanding our severe winters, with ordinary care, better than the natives;

they are more industrious than the native bee, being very active in storing honey in cool, windy, or cloudy weather, such as keeps the native bees quiet in the hive.

The pure Italian, being larger and more vigorous than the natives, go greater distances to collect honey, and as they are larger, they carry more at a time, and being swifter of flight than the natives, they go the same distance in much quicker time. Then, too, the pure Italian bee is very beautiful, nearly the entire body being of a golden color, so that some of its admirers have given it the name of "golden bee." It is very mild in disposition, seldom offering to sting unless unreasonably irritated. They show great activity in protecting their hives from the bee moth, even when weak in numbers. They also show the same trait in defending their stores from the attacks of robber bees. When the native bees have come buzzing around a hive of Italians in search of plunder, I have seen an Italian dart from the hive like a bullet, and seizing a native, while on the wing, bear him to earth and dispatch him with a sting. This feat I never saw a native bee accomplish. Being larger than the natives they are able to reach the honey in the red clover, and many other flowers not accessible to our common bees, which makes an essential difference in the amount of honey collected.

Rev. L. L. Langstroth says of the Italian bees: "They gather more than twice as much honey in the same localities, in the same time, as the swarms of native bees."

I consider the pure Italian bee a valuable and very desirable acquisition. I have furnished several of my lady friends with full colonies of them in Controllable Hives, and they have expressed themselves as very much pleased with their gentle disposition and great beauty.

I think the points of superiority here designated will be found in the pure Italian bee. Very many, who have purchased bees purporting to be Italians, have been grossly deceived, having received simply a native swarm of bees, the queen of which, a pure native, had been impregnated by a drone having a slight tinge of Italian blood; such stock was but very little, if any, better than a pure native swarm.

I find I can make an improvement, even in the pure Italian stock, by selecting queens for rearing to supply my full stocks, and with eggs and drones, from such stocks as show the superior characteristics in the fullest degree. This course persevered in for a term of years will show marked results in the improvement of the desirable points of superiority found in the Italian bee.

I take great pride in my Italian bees. I believe they are as beautiful specimens of this variety as it is possible to produce, and possessing the characteristics of superiority of the Italians in the fullest degree. The points which I strive to cultivate and develop fully, are: Industry, mildness of disposition, beauty of color, vigor of constitution, etc.

I have here given in brief my views of the Italian bee, as I receive many letters of enquiry in regard to them. I base my statements on practical experi-

ence. I would advise all who wish to procure the Italian bees, to exercise great care in selecting them and purchase only of those who are known to have pure stocks, for the best is the cheapest in the end, no matter if the first cost seems high. If the worth of the money is in the bees, the higher the price paid, the better you will be satisfied. But do not pay even a low price for inferior stock, for you will not be satisfied.

I will give the results of keeping the pure Italian bees on my plan as reported by persons who have purchased this variety from me :

A gentleman in Vermont purchased of me, in the spring of 1881, a swarm of Italian bees in a Controllable Hive. He commenced feeding early, with the view of increasing his stocks by new swarms, preferring an increase of stocks rather than surplus honey for that season. The result was an increase of five swarms, all in good condition for winter, and also over seventy pounds of honey in glass boxes.

Another, a lady in Kansas, obtained sixty pounds of box honey from a swarm of Italians, which she obtained from me late in the spring of 1882.

A lady in Illinois purchased of me, in the spring of 1880, a swarm of Italian bees in a Controllable Hive. The first season she got one nice, large swarm and a good yield of box honey. The second season (1881,) she had two swarms to commence with, and obtained four new swarms from that two, and about five hundred pounds of nice honey in glass boxes. In 1882 she had increased her stocks

to ten, and reported that she was meeting with perfect success.

A gentleman in Rhode Island purchased of me a swarm of Italians in the spring of 1883. They gave him in June and July of that year, two fine young swarms, and eighty pounds of honey in glass boxes.

In the spring of 1882, a gentleman in Maine purchased a swarm of Italian bees of me, and that season they gave him five large swarms. They were managed with a view of securing as many swarms as possible, as the gentleman wished an increase of swarms rather than surplus honey.

Every one who has a place to set a hive of bees, would derive great pleasure, as well as profit, in keeping Italian bees in Controllable Hives. They are so docile, so very industrious and so beautiful in color, that one finds real pleasure in their care.

Some of my friends claim that the honey collected by the Italian is of better flavor and a nicer quality generally, than that collected by the common bees; and this may be the case in some localities, where there are certain varieties of flowers accessible to the Italians, but not accessible to the natives, the latter being smaller; yet in my location I see no difference in the quality of the honey collected by the two varieties, but a great difference in favor of the Italians, in the quantity collected.

CHAPTER XVIII.

COMB FOUNDATION AND HONEY EXTRACTORS.

COMB foundation, or artificial comb, is one of the greatest inventions of modern times. By its use the production of honey is greatly increased. To obtain the most satisfactory results from the use of comb foundation, we must use that which is manufactured from pure bees-wax. There is much foundation offered to bee keepers that is wholly unfit for use, the material used in its manufacture being tallow, which is very much disliked by the bees.

Twenty-five years ago it was thought impossible to successfully imitate the bee in the construction of honey comb, but invention has triumphed in this, as in many other improvements deemed impossible. We now have honey comb manufactured by skillful workmen, so closely resembling that made by bees, that it seems the bees cannot detect any difference. I have always studied to give my bees every possible advantage, and I find that comb foundation, used in conjunction with my system of feeding, secures very large yields of surplus honey—much greater than I could otherwise secure. I also find comb foundation of great importance in furnishing en-

couragement to the bees when placed in the brood section of the Controllable Hive. The bees work with greater vigor; besides, with comb foundation we can secure all straight comb. I can confidently recommend the use of comb foundation. It will give perfect satisfaction. Use none but the very best. That with flat bottom cells, and high, sharp side walls, measuring about ten or twelve square feet to the pound, is best for surplus boxes. That for brood frames should measure from six to eight square feet to the pound.

HONEY EXTRACTORS.

In the first edition of this work, I said nothing about honey extractors, for the reason that I could say no good of them at that time; and thought perhaps time might show that they could be used with profit by the bee keeper. I find, after a careful study of the uses of the honey extractor, that it cannot be used to advantage and profit by the great majority of bee keepers, myself among the number.

I am sorry to say this, for I shall tread heavily on the corns of some who have money invested in the manufacture of extractors, and such will be ready to consign me to everlasting punishment, for not recommending the use of honey extractors; but I propose to give an honest, unprejudiced opinion, based upon facts as they have come under my own observation, and time and experience will prove whether I am correct or otherwise. And right here I will venture the prediction, that in less than twenty years it will be impossible to find a honey

extractor, as now used. As they are a hindrance to profitable and successful bee culture, they must ere long give way in the light of reason and progress, as their faults and pernicious effects become better known.

I will give some of the most prominent objections to the use of the honey extractor. I shall not attempt to enumerate all, as it would take more space than I can devote to the subject :

First, the use of the extractor renders the bees cross and irritable to the greatest possible degree. And is it any wonder? The use of the extractor requires that the bees be shaken and brushed from the combs, every two or three days throughout the honey season. Any one who is acquainted with the nature and habits of bees, knows that such a course would in a short time render them so furious that it would be dangerous to go among them. My bees are kind and never sting me voluntarily ; but were I to abuse them thus, they would soon decide that I was their enemy, and would sting me to death at the first opportunity. And who would blame them? Certainly not the dealers in honey extractors, patent bee hives and the like. I don't want to shake and brush my bees out of their combs, every two or three days through June and July, for the sake of obtaining two or three hundred pounds of extracted honey, which everybody will call a counterfeit as soon as it is put in the market ; and which at best will not bring over twenty or thirty dollars ; when I can just as well, and with much less trouble, have the same honey in combs in nice

glass boxes, that every one will know is just what it purports to be, and which will sell readily for seventy dollars or more. In removing the combs for extraction, great care is required, or the queen will be lost, the brood damaged, combs broken in handling, and robbing incited. It is an established fact in bee keeping, that if bees are frequently disturbed in the honey season, they will work but little, but will remain idle about the hive, to protect themselves, rather than fly abroad to collect honey; and if this one point is admitted, it ought to be sufficient to drive the honey extractor out of use.

I am aware that we have very large yields of extracted honey *reported*, but let us accept such reports with caution, remembering that extracted honey is easily counterfeited, and dishonesty is abroad in the land.

Now, if the objections which I offer to the use of the extractor are real (and I maintain that they are, together with many others not mentioned,) are they not sufficient to banish the extractor from the apiary of every one who wishes to keep bees for pleasure and profit?

But to go a little farther and compare prices—for the past two or three years, extracted honey has sold for six, eight and ten cents per pound, rarely for twelve; and slow, hard sale all the way along; while comb honey in nice glass boxes (such as are used in the Controllable Hive) has sold readily for from twenty-five to thirty-five cents per pound, and frequently as high as forty cents. Some may not see clearly why there is this difference in price.

It is expressed in one word : *counterfeit*. Extracted honey can be easily counterfeited ; comb honey cannot. There is much in the market bearing the name of extracted honey, not one drop of which is the product of bees. I have frequently seen this counterfeit in the market, nicely sealed up in glass tumblers and labelled "Pure Honey," and to make the deception complete, a small piece of honey comb, about an inch square, was seen in each tumbler. No doubt the comb was empty when it was put in ; but it seemed to delude many into the belief that the article was pure honey, when not one drop was ever produced by bees.

My advice to bee keepers is, Don't use an extractor, but place your honey in the market in glass boxes, such as are used with the Controllable Hive ; and my word for it, results will please you.



CHAPTER XIX.

MONTHLY DUTIES.

THE successful management and care of bees requires forethought and preparation for all labor and care bestowed on them, if we desire to bestow it at the proper time, and in the most judicious manner. I have in this chapter given only brief hints as to the work to be performed. Such of my readers as are located in a climate essentially differing from that of the New England States, will perceive the necessity of varying their management to correspond with the difference in climate, etc.

I shall repeat some of the statements already made, in order to impress them more thoroughly upon the bee keeper. The object of this chapter is to bring to the mind of the bee keeper the more important duties required in the successful use of the system recommended in this work.

JANUARY.

We will commence with January as it is the first month in the year.

In this month construct hives, glass honey boxes, etc. Give the new hives a good coat of paint.

They will last longer, and as they are to remain out of doors the year around, it is very essential that they be preserved against the weather. A good, heavy coat of paint, spread over good lumber, will prevent cracking and warping. Employ the time, in this month of comparative leisure, in getting everything in readiness for the approaching honey season.

FEBRUARY.

February like January is not a busy month with bees in the Northern States, neither do they require much care. If not finished last month, continue the work of January by making hives, glass honey boxes, and all fixtures required in the management of the bees in the coming season. In some sections bees will fly briskly the last of the month. Clear away the snow from the front of the hives at that time. Set out meal feed for the bees, provided they fly briskly.

MARCH.

At the commencement of this month, clear the snow away from the front of the hives; raise the hives up on blocks at the corners, remove the bottom board under the brood section, and brush out all accumulations, which might invite the bee moth to deposit her eggs, if suffered to remain through the summer. This accomplished, set the hive back in its place. The first day that the bees fly, set out the meal as heretofore directed. Commence to feed liquid feed as early as the bees will take it. Feed regularly every day, or every other day, at

evening. When you commence to feed, remove the packing from the cap, and also take off the ventilator. The space over the comb frames not covered with the feeder, cover with a small honey board. Let the packing remain at the sides until you have put on the side boxes, or until some time in May, as it keeps the brood chamber warm, which is essential in forwarding breeding. Open a small portion of the upper entrance (about one-third) and keep the passage open at the bottom, the same as during the winter.

APRIL.

Early in April—the first warm, sunny day—examine your stocks, and see if they have fertile, laying queens. If the queen is all right, there will be eggs and brood in the brood cells. Don't keep the hives open any longer than is necessary, as the cold air might chill the brood. At this time, if some stocks have a large amount of honey in the combs of the brood section, exchange such with some stock that has but little; as it is a disadvantage to have too much sealed honey in the brood combs in the spring. It sometimes happens that all the brood combs will be filled with sealed honey nearly down to the bottom, leaving but a very small place on two or three combs near the bottom for breeding purposes. In such cases, take out two or three combs, and exchange with other stocks having empty combs, leaving in each such as have brood and eggs, in every stock. Don't take out any bees. In this manner equalize your stocks, and all will be

benefited. If any stocks are found queenless, or with diseased or worthless queens, take means to furnish them with a fertile, laying queen, as soon as possible. In the meantime, keep the entrances to such hives contracted very small, so but very few bees can pass at one time, to prevent attacks from robbers. Queenless stocks, or those which have diseased or drone-laying queens, will not resist an attack from robber bees with as much vigor as a stock having a fertile and prolific queen.

MAY.

If surplus honey is your object the coming season, early in this month put on the boxes at the sides, and the last of the month, or as soon as the bees commence work in the side boxes, remove the small honey board over the brood section, and put on the top boxes, except at the place occupied by the feeder. It may be well to feed liberally for about ten days before fruit blossoms appear, in order to get the bees at work in the boxes. You can judge what is best. If the stocks are backward in breeding, the comb not filled with eggs and brood in nearly every part, it will be best to defer liberal feeding until a little later. You should have the brood combs filled with brood and eggs before liberal feeding is begun, else the bees will fill with honey what should be filled with eggs and brood; and thus the number of bees will be reduced from what there would be if the queen deposited eggs in all the cells. You want all the bees possible to gather the honey harvest of June, July, August and September.

If you want swarms, don't put on any boxes.

About the time fruit blossoms appear, or a little before, open both entrances to their full extent, in all strong and healthy stocks.

JUNE.

This is the month for swarms. It is also the month, in most localities, when the best quality of box honey is collected. If you have arranged for swarms to appear this month, have everything in readiness for them. If you are arranging for surplus honey, remove the boxes as fast as filled, and replace with empty ones. Hive the swarms as soon as clustered. Be sure not to let them remain in the hot sun for any length of time. Have your hives all ready. This month is a good time to rear queens in the miniature hives. Keep the grass and weeds about the hives cut down. They harbor the moth miller, when suffered to grow about the hives.

JULY.

Continue to take off boxes as fast as filled. Keep a sharp lookout that the moth worms do not get in and injure the honey in the boxes which you have removed. If the supply of honey fails when the boxes are only partially filled, feed the bees liberally, until the boxes are finished. Do this as soon as honey fails, as the bees will store faster in boxes if fed as soon as the natural supply of honey ceases. It will be well to put on a few boxes—say, one side to each new swarm which has been hived early: and also on old stocks that swarmed early. Put the

boxes on one side first ; then if the bees go to work in them, put in the other side.

AUGUST.

If you have a market near home, the surplus honey in glass boxes will sell very well the last of this month, before honey is brought from away ; but if you are to ship a great distance, the weather will be too warm in this month. Keep a close watch that the boxes you have taken off do not get wormy. Eternal vigilance is the price of success.

Keep boxes on your hives through this month and next, for surplus honey. Keep down the grass and weeds from about the hives.

SEPTEMBER.

In some localities, September gives a very good yield of honey. I recollect one season in particular, since I adopted my present system of bee management, when the yield of box honey in September was very remarkable. Some of my hives of bees filled their full sets of boxes almost entirely in a few days. I think that it was in considerably less than two weeks, that they finished them up, and they had only a slight start—a few small pieces of comb in some of the boxes, and in the others none at all.

Feed at the last of this month, to complete all partially filled boxes, and at the very last of the month, or first of October, feed such swarms as may be deficient of stores for winter, if you prefer to do this rather than to equalize by exchange of comb frames, as directed in another place. If you decide

to thus equalize, do it the last of October or the first of November.

OCTOBER.

At the commencement of this month, continue to feed such stocks, if any, as are short of honey, yet are supplied with a good amount of comb in which to store honey. As the yield of honey from flowers closes this month, at its end remove all boxes from the hives. Such as are partially filled with comb or honey may be set in a cold, dry place, and remain for use another year. If placed where they will freeze, and then sealed up carefully, so the moth miller cannot get in, they will be in good condition when wanted next season. Boxes that have comb about a third full or even less, are finished very quickly by the bees. Be sure to keep all such boxes for the next season. You probably have a few queens in your miniature hives. Look over your stocks, and if any are found queenless, or with diseased queens, give them a new and prolific one.

NOVEMBER.

The first of November, if not already done, exchange comb frames, from stocks deficient in stores to winter, with such as can spare a frame of honey. Do this until all have stores sufficient for winter. Twenty pounds of honey will render them safe until you begin to feed in the spring. From the middle to the last of November is usually the time to prepare the hives for winter, by packing with hay or straw, as directed in another place. This should not be done until a few days before steady

cold weather sets in. Care should be exercised not to put it off until it is too cold; neither should it be done too early. Be sure to pack thoroughly. Success in wintering depends in a great degree upon thorough work in packing the hives.

DECEMBER.

In this month procure your lumber and all material for making hives, boxes, etc., to be worked up during the winter. If there are small villages or large cities near by, you will find this month a good time to market your honey, if you have any on hand. With a little effort you can have ready customers for your goods, or at least a portion of it. Honey in glass boxes is in such nice shape, that any one who likes a fine article, will pay a liberal price for it, after they have once tested its quality. In a few years you will have established a trade with ready customers, near home, at remunerative prices.



CHAPTER XX.

CONCLUSION.

WE often hear this question asked: "Are bees profitable?" and the replies given are various, contradictory and amusing, varying in accordance with the honesty, experience, skill and success of the bee keeper. Such as have attempted bee keeping with the old fashioned square box hives, under the old system of management based on fire and brimstone, will say there is no profit in bees, and that you must not molest them at all; if you do, "they will run out, and you will lose your luck."

There is another class, who have adopted all the extravagant fancies of the patent bee hive venders, paying large sums of money for hives worse than useless, with what are claimed to be patent fixtures—expecting a sudden fortune as the result, and found the whole thing a fraud. Perhaps they have been duped in this way a half-dozen times or more, and always with the same result. This class will tell you emphatically, that everything pertaining to bees is a humbug and a cheat—no money in them, etc.

In presenting the statements made in this work,

I am not blinded or influenced by any selfish motive, in condemning or recommending any one system of bee management or hive. I only wish to present facts, and do what little I can to make bee keeping safe and profitable to all who engage in it. There is much written on the subject of bees—their habits and management, construction of hives, etc., which is mere guess work. A great deal is written, too, for no other than selfish or prejudiced motives. What is wanted is practical instruction on the subject—such instruction and statements as are based on experience, and will stand the test of application, when brought into active, every-day use.

The real, practical experience of the bee keeper, who has devoted many years to the work, and will tell what has come under his or her personal observation is worth much more than the finest spun theory of the most learned and talented theorist; or in other words, mere conjecture is a poor and uncertain guide in bee keeping. It is an old but true saying that "Practice makes Perfect." In no business will this saying apply more closely or with greater force than to bee keeping.

That bees are profitable when rightly managed, I think I have shown in this little work; and that they can be of no profit, as often managed, I think is equally made clear.

The natural habits of bees have not been sufficiently understood by the majority of bee keepers. This has rendered them an easy prey to the many speculators in bee hives of peculiar shape and construction, who are constantly urging their claims to pos-

sessing great knowledge of bees, when perhaps they never saw a bee; and care not one straw for the advancement of successful bee culture. I find, with the great majority of hives now in use, there are many obstacles to successful and profitable bee keeping. There is too little room for storing box honey in them. Boxes are often difficult of access to the bees, so that they manifest much reluctance about entering them, often clustering on the outside of the hive through the honey season, when they should be at work in the boxes. Then, too, the boxes are usually too large, which renders the honey unsalable. Honey in large boxes often contains cells of brood, and bee bread, or pollen, interspersed among the honey cells, which are a great damage to it, rendering it very unsalable. Glass boxes, each holding about four and one-half pounds, is the proper size. A swarm of bees in a hive with thirty of these boxes, judiciously arranged, will fill them nearly as quickly as they would half the number, as the bees have ample room to work without crowding.

There are a vast number of bee keepers who now have bees which are of no profit to them, but instead are only a perplexity and trouble. If such would manage their bees on correct and scientific principles, in accordance with their natural habits and instincts, with judicious care and attention bestowed at the right time, and in the proper manner, using a hive constructed in accordance with those principles, they would be surprised at the results which would follow.

To succeed with bees, we should recollect that personal experience is the best guide; and next to this is the instruction of those engaged in the business, who prove by the results which follow their management, that they make bee culture profitable. In commencing bee keeping, if you purchase bees, use great care in doing so. Buy none but strong, healthy stocks. If you purchase in box hives or patent hives, you will be very likely, if not acquainted with bees, or unless purchasing of some reliable person, to get diseased stocks; and again, a person who keeps bees by the ordinary methods, is very likely to have diseased stocks which he thinks are all right. So, great care is necessary in buying your outfit to commence bee keeping. Diseased stocks are dear at any price. You want the very best to start with, if you can possibly get them. Be sure to get such stocks as have young queens, for if the stock has a queen four years old or more, (and they are likely to be that old in box or patent hives, under ordinary management,) such a queen is liable to fail at any time, and loss of the stock follows.

In commencing to keep bees, if possible start with good, strong, healthy stocks, in the right kind of a hive; then you will have no difficulty in changing them. But if this cannot possibly be done, be sure to start with strong, healthy stocks. If you must take second-class hives, of this class the plain movable comb and box hives are best. But be sure to let the patent hives entirely alone; they are a curse to the bee keeper. If you get your bees in second-class hives, transfer them to Controllable

Hives, or as fast as they swarm put them in Controllable Hives. In this way you will soon have your bees in shape to pay you a good profit.

When you begin keeping bees, study closely their natural habits and requirements. Give them such care and attention as your judgment and present knowledge teach they require. Persevere, and ultimate success is certain.

Every one who attains success with bees, will find that there is something more to be done, than simply to stand with folded hands, with the expectation that a fortune must inevitably follow. Know the precise condition of your bees at all times—whether they are weak or strong, whether they are without a queen, or whether the queen has become so old as to have passed her usefulness. After a period of years queens become barren, and unless they are removed, and a young queen substituted, the bees will rapidly decline in numbers, and all disappear from the hive in a few weeks or months.

It cannot be too strongly urged upon the beginner, this great necessity of securing strong, healthy stocks to begin with; and if possible, get them in the Controllable Hives. All who do not fully understand the management and nature of bees, would save themselves much trouble and perplexity, by procuring, to begin with, one or more healthy colonies in the Controllable Hive. Your chances of success in the end, and your profits of the first season, are greater from one swarm in this hive, than from six in second-class hives. If you purchase bees in inferior hives, you will need to ex-

ercise great care that they are not diseased. There is not one box or patent hive in fifty (as ordinarily managed) but that is diseased. They are either badly infested with the bee moth, have old, mouldy black combs, an old and diseased queen, or are in some way diseased. No matter how low the price paid for such stocks, they will be found expensive. Be sure to get none but the best to commence with ; they are the cheapest in the end.

I might illustrate this with many cases that have come under my observation. One or two I will mention : A gentleman in Connecticut ordered of me a swarm of Italian bees in the Controllable Hive, in the spring of 1880, for which he paid me twenty dollars. He wrote me in June that they were doing finely, and that he never saw bees work so well—they were at work in all the boxes, some of them being nearly filled with honey, and all the combs being filled with bees at work storing ; and from appearances he should get a large amount of surplus box honey from them.

Another gentleman wrote me, about the same time, asking my price for a swarm of Italian bees, and when informed that it was twenty dollars, he wrote me that as he could get the Italian bees nearer his home for ten dollars, he would not order of me, but would invest his twenty dollars and get two swarms instead of one. He has since written me that one of the swarms for which he paid ten dollars he had lost outright, leaving him only a mass of moth worms in old and mouldy black combs. The other has proved to be queenless, and has caused

him more trouble and perplexity than it is worth, to say the least. There is now not over a pint of bees in the hive, but he has put in a queen and hopes to save them from total loss.

I know of another case where a gentleman bought six swarms of bees in box hives. They were very heavy and he thought of course they were all right. He knew nothing of the diseases of bee, and supposed if they were heavy, and had honey enough, that was all that was necessary. He bought them in the fall at a very low price, and was much elated over his purchase. Five of the six swarms died during the winter, and the remaining one came out in the spring so weak as to be of no profit whatever the next season; and the next winter that also died.

It is an established fact that to succeed well with bees they must be kept in hives suited to their habits and requirements, and with the view of rendering them profitable. Such is the Controllable Hive. And they must be managed on principles in accordance with nature's laws, and the instincts and habits of the honey bee. Such is the new system recommended in this book—BEE KEEPING REDUCED TO A SCIENCE; no "luck," no "guess-work," no "chance" about it.

Trusting that this little work may be the means of greatly increasing the profits of bees, I bring it to a close.

